

THE AUTOMOBILE



Start of the Annual Endurance Run of the Winnipeg Automobile Club, the Most Successful in Its History.

WINNIPEG, MAN., Aug. 25.—The Winnipeg Automobile Club's annual endurance run for 1908 took place from August 15 to 18, over an extremely trying course, 425 miles in length. Twenty-two cars were entered for the event, as follows:

Oldsmobile, J. Maw.	McLaughlin, Chas. Newton.
Oldsmobile, John Moran.	McLaughlin, R. McKenzie.
Oldsmobile, D. B. Sprague.	McLaughlin, W. Sweatman.
Oldsmobile, D. Glasgow.	McLaughlin, Harry Gooderham.
Oldsmobile, G. Walker.	McLaughlin, P. C. Hagarty.
Oldsmobile, T. Loudon.	McLaughlin, W. Borebank.
Oldsmobile, G. A. Mitchell.	Russell, W. E. Wright.
Oldsmobile, F. Raynsford.	Russell, Canada Motor Co.
Packard, Mrs. E. Nicholson.	Royal Tourist, W. R. Bawlf.
Packard, Hon. Robt. Rogers.	Buick, E. Patterson.
Cadillac, Russell MacLeod.	Mitchell, F. R. Newman.

The different makes of cars represented being divided as follows: Packard, 2; Royal Tourist, 1; Russell, 2; McLaughlin, 6; Oldsmobile, 8; Mitchell, 1; Cadillac, 1; Buick, 1.

Four cars finished with an absolutely perfect score, they being:

Mrs. Nicholson's Packard.
Hon. Robt. Rogers's Packard.
W. E. Wright's Russell.
J. Maw's Oldsmobile.

The judges in making their award decided that these four cars should be asked to go through a further trial in order to decide the winner of the Oldsmobile trophy and the silver cup which goes to the car taking first place, and another cup presented for the second. This will in all probability be run off on September 5 and 6, the two days preceding the date fixed for the Dunlop trophy race, which is a speed event and is scheduled for September 7.

How the Tour Progressed from Start to Finish.

The twenty-two cars left Winnipeg at 8:40 A.M., August 15, the first day's run being to Brandon, distant 142 miles. All the cars made the trip without trouble except with tires, with the exception of G. Mitchell's Oldsmobile, which broke the hub gear on the driving wheel and was held up until a new wheel was obtained from Winnipeg, the car coming on after repairs had been made, rejoining the main body at Brandon on Sunday

morning and finishing the tour without any further trouble. The route during the latter portion of Saturday's run was of a very trying nature, being of a very up-and-down character, the road surface being loose and sandy, making the work on the engines of an extremely arduous nature. Sunday was spent in Brandon, not being included in the tour proper.

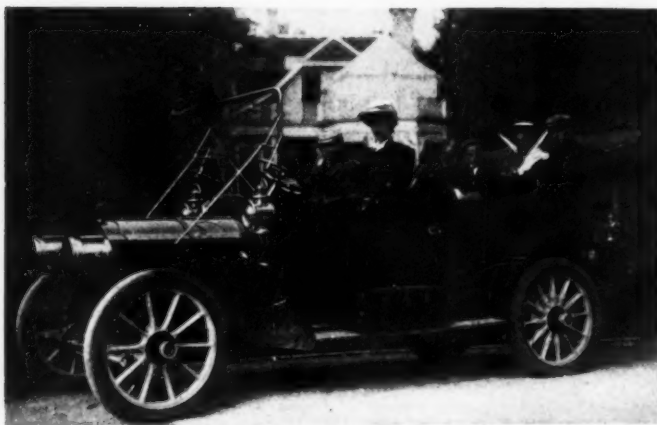
Monday the start from Brandon was fixed for 8 o'clock sharp, and prompt to time all the cars were in position waiting for the pathfinder to get ahead of the main body. During the wait Mayor Clements of Brandon, accompanying A. W. Elliott of Brandon in his Chatham car, joined the tourists and a big Thomas touring car loaded with prominent citizens of Brandon was also in evidence for the purpose of escorting the tourists on the first twenty miles of the day's run.

Twenty-two miles from Brandon, the home of W. Carroll, M. P. P., "Father of the Manitoba Motor Act," was reached, and here the tourists met with a most hearty reception, which included refreshments. This act of courtesy was highly appreciated by the tourists, showing as it did the large-minded manner in which automobilists are treated by the farming class, of which Mr. Carroll is a most prominent figure. In fact, all through the tour the farmers along the route suspended their harvesting operations to cheer the tourists as they passed by.

Newton's McLaughlin came to grief between Minto and Bois-sevain, with a connecting rod seized, due to overheating, but the repair car with its excellent staff of mechanics managed to get him running again inside of five hours and both cars caught the crowd before the completion of the day's run.

There Were Numerous Receptions En-Route.

During the afternoon run receptions were the order of the day, nearly every town that was passed through having a reception committee on hand to welcome the tourists and invite them to participate in some form of entertainment, that at Kil-larney being to a trip on the beautiful lake by steamer, while at Pilot Mound a magnificent bouquet was presented to the lady in the leading car by the ladies of the town, and an excellent light supper provided for the whole party. The time lost



Mrs. E. Nicholson's Packard. One of the Perfect Scores.

Finished with a perfect score in Winnipeg Auto Club's 1908 Endurance Run for Olds trophy. This car left Winnipeg, August 25, for a tour from Winnipeg to New Orleans, going by road throughout.

on the running schedule caught the tourists in the dark with still twenty miles to cover, including a long climb of nearly two miles in length, the steepest part of the grade being about 1 in 7, with several sharp curves rendering the task of suc-

cessfully negotiating the hill a matter of skilful driving to prevent stalling the engine. It is doubtful whether any of the hill climbs in the United States could compare with this particular hill for stiffness, and it is the intention of the Winnipeg Club to hold a hill climbing contest on this hill at an early date.

When the cars arrived at Lariviere at 9:45 P.M. the townspeople had a huge bonfire lit in order to obtain a good view of the cars as they arrived, and the tourists were once more greeted with an address of welcome, which with the acknowledgment on behalf of the Winnipeg Club by President Russell MacLeod, delayed the run for another 20 minutes, making it past 11 o'clock before the night control at Manitou was reached. In spite of the late arrival the whole town was out waiting the arrival, and as the hotel accommodation was insufficient to meet the demand the citizens came to the rescue, the tourists being provided with sleeping accommodation in their homes.

The home run was fatal to the chances of quite a number of competitors owing to broken springs, W. R. Bawlf's Royal Tourist and Dr. Glasgow's Oldsmobile being among those falling from this cause. The remainder of the run back to Winnipeg was covered without incident, beyond the decorating of each car with wheat sheaves obtained from a farm about 15 miles out.

Eighteen of the twenty-two cars finished at the *Free Press* office at 7:35 P.M., their arrival being welcomed by a big crowd.

POPE-HARTFORD LEADING WINNER MINNEAPOLIS CLIMB

MINNEAPOLIS, MINN., Aug. 30.—One distinct winner was evolved yesterday in the annual hill-climb of the Minneapolis Automobile Club, which is something unique in the annals of this style of motor competition and which at the same time will prevent many from making claims not borne out by facts. In doing this the "Gophers" used the Chicago Motor Club formula, which brings out motor efficiency, the handicap being based on piston area multiplied by time and divided by the weight of the car. Using this formula, the officials of the contest formally awarded the chief prize in the test, the Minneapolis *Journal* \$1,000 trophy, to H. J. Clark, an amateur driver, whose 27.2-horsepower Pope-Hartford showed best under the formula, its percentage figures of 3.53 being the lowest of the fifteen cars that competed in the handicap events. As figured under the formula the cars were rated as follows:

Car.	H.P.	Driver.	Pct.
Pope-Hartford	27.2	H. J. Clark	3.53
Corbin	32.4	Gordon Bird	4.21
Bulck	22	C. Nyquist	4.30
Bulck	22	D. W. Onan	4.52
Overland	19.6	B. Fawkes	4.60
Stoddard-Dayton	36.1	A. C. Miller	4.73
Rambler	32.4	E. Sampson	4.90
Jackson	22	W. G. Benz	4.95
Ford	22.5	G. Dorr	5.09
Ford	22.5	W. E. Wheeler	5.18
Pierce-Arrow	60	P. Hofmann	5.50
Overland	19.6	L. Bousfield	5.84
Holsman	12.4	W. C. Rader	6.547
Schacht	14	H. B. Allen	6.599
Rambler	20	J. B. Lee, Jr.	7.44

Eight classes were provided for and in these there were

twenty-four contestants. Four of them were handicap events and the others were decided on straight time, the results being as follows:

CLASS A, MOTOR BUGGIES, HANDICAP.

Car and driver.	Time.	Pct.
Holsman, W. C. Rader	:72	6.547
Schacht, H. B. Allen	:80.4	6.599

CLASS B, HANDICAP.

Bulck, C. Nyquist	:44 2-5	
Bulck, D. W. Onan	:46	4.52
Overland, B. Fawkes	:50	4.60
Jackson, W. G. Benz	:51 3-5	4.95
Ford, G. Dorr	:47	5.09
Ford, W. E. Wheeler	:49 4-5	5.18
Rambler, J. B. Lee, Jr.	:78 4-5	7.44

CLASS C, HANDICAP.

Pope-Hartford, H. J. Clark	:43 4-5	
Corbin, G. Bird	:33 2-5	4.21
Rambler, E. Simpson	:45 4-5	4.90

CLASS D, HANDICAP.

Stoddard-Dayton, A. C. Miller	:35	4.73
-------------------------------	-----	------

CLASS E, HANDICAP.

Pierce-Arrow, P. Hofmann	:37	5.50
--------------------------	-----	------

CLASS F, FREE-FOR-ALL.

Pierce-Arrow, P. Hofmann	:38 3-5	
--------------------------	---------	--

CLASS G, FREE-FOR-ALL.

Corbin, G. Bird	:33 2-5	
Stoddard-Dayton, A. C. Miller	:35	

CLASS H, HANDICAP.

Pope-Hartford, H. J. Clark	:43	3.47
Overland, L. Bousfield	:64	5.84

CLASS I, FREE-FOR-ALL.

Moon, G. H. Seeley	:47	
Rambler, J. B. Lee, Jr.	:81 4-5	

OPEN RUN AROUND LONG ISLAND TO TEST STOCK CARS

BY way of demonstrating the running qualities and mechanical efficiency of fully equipped stock cars of the various models that may be entered, the New York Automobile Trade Association is to promote Wednesday and Thursday, September 16-17, a combined road test and pleasure run around Long Island.

Roughly estimated, the two days' tour will cover some 275 miles. The first day the course will be along the south shore of the island, with a noonday clambake at Blue Point and a mammoth ox roast at Montauk Point, the night stop. On the return trip the caravan will cross to the north shore from Good Ground and stop for luncheon at Riverhead.

The cars will be divided into six price classes, with an added

class for taxicabs carrying two passengers and a driver. The classification will be: Class A, \$850 or less; class B, \$851 to \$1,250; class C, \$1,251 to \$2,000; class D, \$2,001 to \$3,000; class E, \$3,001 to \$4,000, and class F, \$4,000 and over. The taxicabs will be grouped under class G. The classes will be further subdivided according to their passenger-carrying and load capacity. There will be a liberal time schedule and time limit.

The management of the run has been placed in the hands of W. J. Morgan and the working out of the technical details has been entrusted to Alex. Schwalbach, who as secretary may be addressed at the Thoroughfare Building, Broadway and Fifty-seventh street.

OVER THE ALLEGHENIES FOR A FAST TRY-OUT

By A MODERN TRAVELER.

LAST Thursday it took S. D. Waldon just 15 hours 58 minutes to drive a 1909 Packard car from Pittsburg to Philadelphia, thereby smashing the automobile record between those cities by a couple of hours. A generation past it took the rolling, jolting stage coach fifteen to twenty days to make this same 304-mile journey over the Alleghenies.

Times have changed and travel has changed, but the old Forbes military road, built more than a century ago across Pennsylvania, has changed but little. The wildly curveting stage, hitting the high spots as it bumped roughly and recklessly over the mountains, is merely a dim recollection. The road itself is coming back into its own.

Along the road's eastern part the whole country has changed since the colonist generals engineered its making. Valley Forge

waterbar. These were put on the road originally to turn the course of water from heavy rains into the gutter and thus prevent the washing away of the road. The road has been long since washed away. The waterbars now keep the rains from washing the loose stones off the jagged rock foundation.

In the valley towns, whose only excuse for being seems the mere habit of existence, are taverns whose halls once echoed the boisterous merry-making of stage coach travelers; where the tavern keeper once poured bad wines down the dusty throats of thirsty stage drivers, at whose tables tired passengers once sat down to boiled dinners. Some of these taverns have obtained a new lease on life. The village loafer has been moved to the far corner of the bar to accommodate the begoggled motorist, down whose dusty throat the tavern keeper now pours bad whisky. At the tavern table the modern knight of the road feasts on fried chicken, apple butter, and other substantial of a period before the Astor butted into the hotel business, but not so long ago as to have been forgotten when a Michigan-made stove transplanted the original fireplace.

There is Old Joe at McConnellsburg, whose memory far exceeds his age and who recounts more traditions of these everlasting rocky hills than were ever set down in authentic history. He knows the man who invented the mighty brake with which the mountain wagons are held against perilous flight



"Thank-You-Ma'ams" Were Numerous.

attained a place in history and became an everlasting memorial to Washington. Gettysburg attained a place in history and became an everlasting memorial to Lincoln. Philadelphia spread her metropolitan airs over the vicinity, and the Forbes road was graced with beautiful country estates and well-groomed suburban towns. The Pennsylvania Dutchman and the Quaker covered the road's original clay with macadam and dotted the hillsides with large barns and small houses. The trolley worked its way into the district and the toll-gate changed its program to make automobiles the top-liner.

The western part of the Forbes road is the same old mountain highway. It is still a trunk line through a wild country, full of rattlesnakes, trees, and rocks, where wide perspectives have no trace of habitation, cultivation, or epulation. The road is an air line. It goes over the mountains as nearly straight as its builders were able to make it. In some places it is simply a traveled course on the naturally flat mountainside. In other places it is a shelf hewn with difficulty in the native rock. It is fenced with thick forest, except where it rises above the trees and sticks boldly out on top of some ridge or mountain crag. It rises in a steady ascent for 5 and 6 miles at a time, simply to run down into the next valley, which is valley only by comparison, because the lowest level is high above the sea. Almost all of the clay which originally surfaced the road has been washed away. For scores of miles the road is simply a trail of bed rock, littered with loose stones. Every two hundred feet there is an immense



Forbes Road Over Alleghenies Has Steep Grades.

down the steep grades, and he thinks he knows the exact dialogue between George Washington and General Forbes when they discussed the surveying of the highway. He makes a specialty of automobilists. Over 500 cars have passed through McConnellsburg this year. Joe has entertained nearly 300 parties and expects to exceed that figure by the time cold weather comes.

The man who sells everything from rattlesnake belts to self-rising pancake flour has added gasoline and cylinder oil to his list and is local authority on automobiles. He says that there have been more Packards over this route than any other car and that over thirty Packards passed through McConnellsburg during the last two weeks.

Mr. Waldon's record run was his third trip over this road. Each year the Packard Motor Car Company sends its cars over thousands of miles of the roughest roads in general testing and



On Top of Little Round Top at Gettysburg.

development work. The long, hard runs across Pennsylvania suggested the fitness of the Allegheny Mountain district as a permanent testing place. Consequently a Packard camp was established at McConnellsburg and three experimental Packards were put through their paces in that vicinity. For a fortnight these cars were driven by different members of the Packard executive staff, engineering department and men from the factory. Different parties of Packard dealers and several Packard owners were brought to the camp to see the cars perform over Cove Mountain and other difficult stretches of road in the vicinity. So successful was the work accomplished and so extreme was the test given the cars that the Packard company is preparing to erect a permanent garage on Cove Mountain, near McConnellsburg, as headquarters for future testing.

There had been no through trips from Pittsburg to Philadelphia and return until Mr. Waldon first attempted to drive a Packard over the road in one day. This summer he essayed to establish a record that would test the ability of the car in continued hard running over a mountain road, in whose entire 300 miles there is no chance for high speed running and on which a fast record must be made absolutely by steady plugging. The result is the present record, at which the automobilists who have traveled in this country marvel.

Mr. Waldon left Pittsburg at 4 o'clock in the morning with a party of five in a standard touring car. The first half century of the trip was made before dawn over that hilly, tortuous road leading to Bedford Springs, which is familiar to all of last year's Glidden tourists. From Bedford the course turns northeastward through the very heart of the mountains and then runs eastward through Chambersburg and Gettysburg to Lancaster, where it strikes the famous Lancaster Pike leading into Philadelphia.

The foothills of the Alleghenies begin immediately out of Pittsburg and our early morning ride was simply an unbroken struggle against grades and waterbars. The brakes had to be used on both sides of each mountain. For mile after mile the car would be tossed from "thank-you-marm" to "thank-you marm," until finally it reached the apparent top of some ridge, only to descend by an equally arduous road to the bottom of a valley, whence it would rise again through foothills and finally onto the last, long climb of the next mountain ridge.

When daylight succeeded Prest-O-lite, the view from each height showed in the hazy distance a long, blue bank on whose crest an occasional break in the forest marked where the road 25 miles away touched the clouds. "Beating it" between crests meant simply a continual zigzagging from one side of the road to the other in order to strike the waterbars obliquely and rise over them with undiminished speed but with lessened jolt. Up hill and down hill, it was the same steady 25 to 30 miles an hour. In one, two, three order the wheels slammed over the waterbars, the car was yanked straight again and then pulled to the right of the road to take the next obstruction.

There is no let-up in these waterbars. Two hundred feet apart they are like rough ties in a giant, railless railway between

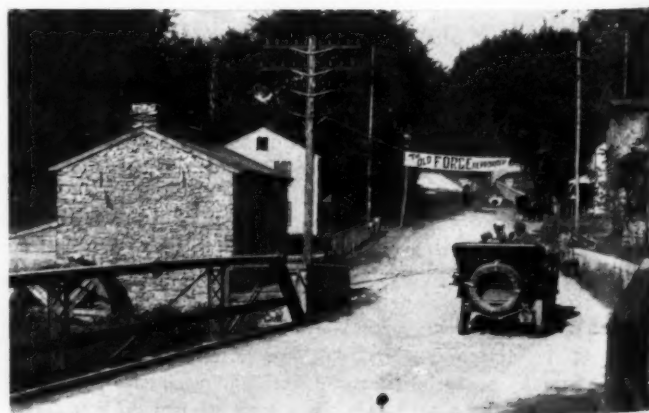
Philadelphia and Pittsburg. Even when the road swept down the eastern face of the last mountain ridge and into the rolling farmland of eastern Pennsylvania, even when the now leveller road became a comparatively smooth macadam—still the waterbars remained to check the flight. Record breaking continued just a persistent struggle against stubborn obstruction. Since 4 o'clock in the morning Waldon had stopped only while an exploded tire had been repaired and at noon to feed the car with gasoline. The human stomach had to be satisfied with a cold lunch carried in the car.

Occasionally a slanting pole across the road meant a toll-gate and a brief respite from the bouncing, tiring journey; occasionally a small village meant a brief respite from the unpopulated hills or from the wearisome quietude among the apathetic Pennsylvania farmers. Not until the refining influence of Philadelphia was approached and the Lancaster pike had become a boulevard through beautiful suburban villages was there a restful breath or an easing up of the tense attitude that had been taken to conquer the roughness of a highway which was built for stage coaches and seems to have a natural protest against its adoption by motor cars. Then the town marshal took the place of the waterbars and stood with almost the same frequency on the road, waiting to arrest progress if progress gave him the chance by violating speed laws.

Really a record run from Pittsburg to Philadelphia should end at the city line. It seemed that night, wandering into Quakertown over a smooth but uncertain way through Fairmount Park, that we were trying impatiently to get done with an anticlimax. The noise of a big city does not appeal strongly to the reactive nerves of a record breaker who has finished his job. His atmosphere is the wild hillside or the open road where the wind blows the dust across an astonished countryside. His hotel is the country tavern. His garage is the country hardware store, where gasoline is sold at prices that would make the Standard Oil Company blush with shame. His lights are the glaring headlights which peer into the darkness before dawn or the deep black of midnight and tantalizingly beckon him to go on faster and faster into the secret paths of the mountains.

There should be an inn at the city line; an inn for record breakers; an inn like we used to have in the old mediæval times when the knight errants rattled into a stone-flagged courtyard, jumped from tired horses and thumped into the great room where mine host set before them bread, meat and wine, according to the best style of historical novels—a room where they could loudly bang on the tables and, sprawling on crude benches, as loudly gabble over the happenings of the day. Enter then the record breakers, noisily:

"What ho, varlet! Meat not steaming on the board? Think ye that we, who have ridden since the cock crowed, a hundred leagues o'er yon accursed mountains in our valiant Packard, are not raving with thirst and nigh to perishing of hunger? We have smashed the record and right heartily would we eat. Beat it to the kitchen, you mutt."



Valley Forge Lies Close to Old Forbes Road.



Attaching Ropes to Basket for Malecot Combination Airship.

PARIS, Aug. 22.—It is an easy job that the eight policemen and one brigadier have at the Issy-les-Moulineaux ground from 4 to 6 a. m. every day, for although the Parisian is naturally an early riser he is not equal to reaching this distant military ground at daybreak. Consequently the aeronauts can operate in that isolation that Wilbur Wright sighs for.

Captain Ferber, inventor of the Farman type of aeroplane, has been busy every morning with his new biplane, constructed and engined by the Antoinette company. Having been recalled to active service, the captain has made a gift of his new machine to M. Legagneux, a young enthusiast, who after three trial trips succeeded in covering a distance of 280 yards under official observation, thus winning the third of the prizes offered for a flight of not less than 200 metres. The first two were won by Delagrang and Bleriot.

Ferber's machine, known as the *Ferber IX*, is a nearer approach to the Wright Brothers' idea than any aeroplane built in France. Its bearing surfaces consist exclusively of two superimposed planes. There is no tail; the elevation rudder is in front and the lateral rudder in the rear. On the first trials the balance was not perfect, the rear rudder too did not appear to have any power to bring the apparatus into the wind as it should have done, the aeroplane falling off whenever it was taken a point or two out of the eye of the wind. Starting is effected by means of a couple of pneumatic shod wheels in tandem and mounted on powerful hydraulic shock absorbers.

Gastambide-Mengin has the honor of being the first to rise in the air on a monoplane machine with two persons on board. The performance was made at Issy one morning last week, the distance covered being about 120 yards. The machine was engaged for the 200 metres competition, but was unable to run owing to the ground being closed at 6 o'clock just as the apparatus was ready to compete.

A New Aeroplane Recruit at Issy.

A new recruit at Issy, the tri-plane Bousson-Borgnis, failed to make a good impression on its first outing. The new aeroplane is a curious looking structure, having three curved, superimposed bearing surfaces with a strong resemblance to the wings of a huge bird. At the front are a couple of elevation planes also shaped like the wings of a bird. The entire apparatus is mounted on a stout carriage borne on three small pneumatic tired wheels, the driving power being a six-cylinder engine operating a four-bladed propeller at the rear through shaft and chain drive.

Sky pilots are seeking to escape from the annoying restrictions

of Issy, the Antoinette company having already secured a training ground on an island in the Seine, some distance above Rouen. Here they have a length of about one mile by three-quarters of a mile, where no restrictions whatever are in force and which cannot be reached by inquisitive sight-seers. Delagrang is looking for a private ground before resuming work and Farman will also make a change if possible.

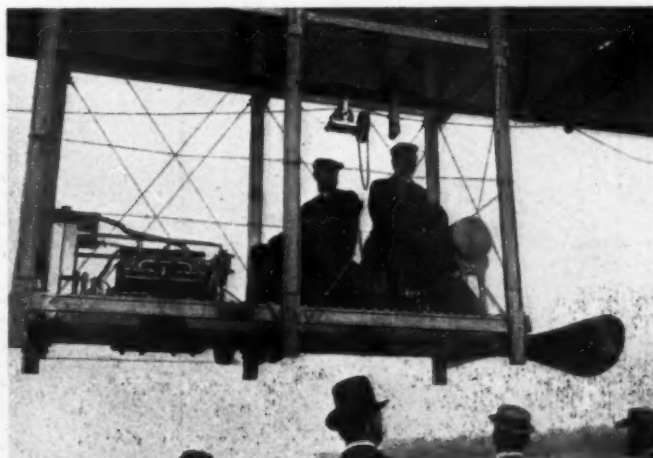
An aeroplane section will be included in the Paris automobile salon this year for the first time. The section will be a purely commercial affair, only current models of aeroplanes and aeronautical motors as placed on the market being on exhibition.

Issy-les-Moulineaux now has a hybrid in the form of a cross between a dirigible balloon and

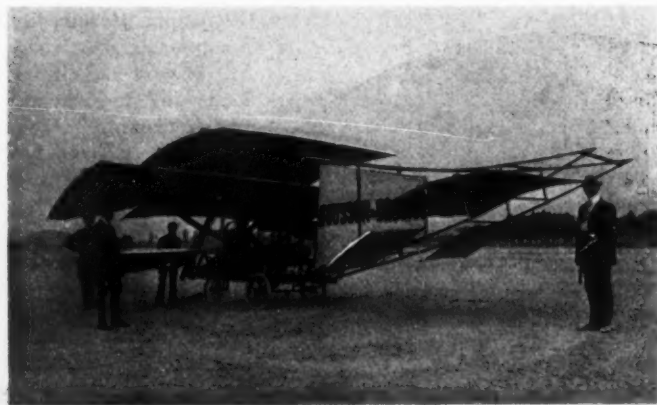
an aeroplane, a production due to the inventive genius of M. Malecot. It consists of a cigar-shaped gas bag inflated with hydrogen and having a lifting capacity of 600 pounds, or sufficient to raise its machinery, two passengers and a small amount of ballast. But, unlike the ordinary dirigible, the Malecot machine does not depend entirely on the lifting power of its gas.

Immediately below the gas bag is the aeroplane portion, consisting of a couple of parallel planes running the full length of the lower part of the balloon and terminated by a vertical rudder. Below this again is an open wooden cage on the floor of which is installed a four-cylinder water cooled automobile engine, the installation and fitting of which is exactly similar to that of a car, with the exception that instead of driving a rear axle the propeller shaft bears a two-bladed propeller at its extremity. The pilot and mechanic occupy basket-work chairs just to the rear of the dashboard and still further to the rear is the gasoline tank on raised brackets.

Owing to the large bearing surface under the gas bag the apparatus naturally rises and descends vertically with a certain difficulty. Thus an ordinary balloon basket has been attached some distance below the engine cage, one rope going to the forward end of the frame, the other to the rear, and both passing over pulleys above the pilot's house. By these means the position of the basket can be varied sufficiently to raise or lower either the nose or the tail of the balloon and provide for ascent or descent. When sailing



Pilot and Mechanic in Malecot "Engine Room."



First Attempt of the Aeroplane Bolsson-Borgries.



Ferber Aeroplane Driven by M. Legagneux.

on an even keel the basket is, of course, kept in the line of the center of gravity. This method of raising and lowering a dirigible balloon is similar to that adopted by the early sky pilots, with the difference that instead of a basket a heavy trailing rope only was employed; the method of shifting to alter the center of gravity is, however, the same.

Satisfactory trial trips were made over the Issy-les-Moulineaux ground this week and further trials are promised at an early date before a military commission interested in the balloon for army work. The claim made for this apparatus is that should the gas bag burst a gradual descent could be made.

PILOTS FOR AERIAL GORDON BENNETT.

PARIS, Aug. 27.—With the exception of one of the Belgians, all pilots have now been appointed for the Gordon Bennett balloon race to start from the suburbs of Berlin, Sunday, October 11. The list of sky pilots stands as follows: United States, Frank P. Lahm, McCoy and Forbes; England, C. S. Rolls, Prof. Huntington, John Dunville; France, Emile Carton, Jacques Faure, Alfred Leblanc; Germany, Oscar Erbsloh, Capt. Abercron and Dr. Niemeyer; Italy, Prince Borghese, Uselli and Capt. Frassinetti; Switzerland, Dr. Beauclair.

BRITISH AIRSHIP FAIRLY SUCCESSFUL.

LONDON, Aug. 27.—The new British Army airship "Dirigible II," although a great advance upon the "Nulli Secundus," is still many years behind the French and German craft. It has been increased in size and some refinements in detail made, but there is still much to be done before a really practicable dirigible is evolved. It attained a speed of about twelve miles an hour on its trial trip, but was nearly wrecked returning to its shed.

FRENCH EIGHT-DAY TAXICAB TEST.

PARIS, Aug. 22.—A fixed course around Paris, starting from the Port Maillot, passing through Maisons-Laffitte, St. Germain and Versailles and finishing at the point of departure, has been selected for the eight-day taxicab and light delivery vehicle competition next October. The main reasons for keeping the cars on one course for eight consecutive days is to give an opportunity of more accurately controlling and comparing the consumption of the various fuels employed. In addition to a couple of days on gasoline, each competitor will have to cover the regulation distance on alcohol, white spirit and benzol, official observation being made of the quantity of each consumed. This should provide some valuable comparative figures on the cost of fuels, although alcohol can hardly be expected to give its best efficiency except in engines specially designed for its use.

By starting in the early morning and finishing at the same place in the early afternoon drivers and helpers will be able to return to their homes or business each day, a rather important consideration in view of increasing activities in the automobile trade on the approach of the shows.

Contrary to the usual plan of procedure in competitions, only one man will be allowed on each taxicab, hotel omnibus or delivery vehicle. The organizers declare that this step has been taken in order to remove the impression prevalent among business firms that two men are required to run an automobile. The plea is often put forth that mechanical traction is more costly than horse haulage because in addition to driver and delivery man there will be required a mechanic on the automobile, making three men where two are now employed. In the Paris competition all work must be done by the one man in charge of the vehicle, no outside help whatever either on the road or in the parking stations being allowed.



"Dirigible II," the New British Army Airship Making a Successful Ascent.



One of the Nearly Completed Stretches of the Long Island Motor Parkway, That Will be Used in Vanderbilt Cup Race.

KNOX ENTRIES FOR VANDERBILT—LIST REMAINS OPEN.

AMERICAN makers are beginning to wake up to the opportunities the Vanderbilt Cup race will afford for the demonstration of the speed and road qualities of their cars. A manufacturer hitherto not identified with road racing, the Knox Automobile Company of Springfield, Mass., sprang a genuine surprise this week by nominating two of its stock cars for the Long Island classic. Both are of the 1909 vintage and of the 4-cylinder type. Model M, a 48-50 horsepower machine, with 5 1-2 by 5 1-2 cylinders, is to be driven by Charles S. Basle, who scored records for H. L. Bowden at Ormond in his big Mercedes. Model O, a 38-40 horsepower car with 4 7-8 by 4 3-4 cylinders, will be piloted by William Bourque, who has been at Knox wheels in some hill-climbing contests.

The officials of the Springfield company had the speed possibilities of the Knox impressed upon them by the performances of their 1909 cars at the Wildwood, N. J., straightaway races on August 3. At this meet Knox cars won 8 out of 10 events, scoring 47 2-5 seconds for the mile, a rate of 76 miles an hour, and 28 seconds for the kilometer.

In a trial for the Lowell race, however, Basle, over a measured mile, showed the Knox "M" capable of 81 miles an hour. The nomination of the Knox pair was made on September 1, the date originally set for the closing of preliminary entries. On that day, though Chairman Thompson, of the Vanderbilt Cup Commission, announced that the double fee originally intended to be charged for entries made after September 1 up to October 1 would not be exacted and that the fee for all would remain at \$1,000. This action was dictated by diplomacy and the uncertainties of the racing situation at present. The chairman realized the fact that some makers desired more time to reach a decision and others would very likely follow the example of the Knox people and compete in the race with high-powered stock cars.

On the date originally set for closing the actual paid entries were a Mercedes, a Mora, an Acme, a Chadwick, and the two Knoxes. Entries of two Locomobiles, a Thomas, and a Roebing were promised and plans were on foot for the participation of

the Pope-Toledo and Frayer-Miller Vanderbilt racers of 1906. Negotiations were also in progress for a Pennsylvania. A nucleus of thirteen cars was accordingly fairly well assured, with the claim that subsequent entries likely to be made by October 1 would raise the number of contenders to at least a score.

Robert Graves has secured Emile Stricker to drive the Jenatzy Mercedes, his original Vanderbilt entry. Stricker has been a Protos pilot in the last two Grand Prix contests. He was some years ago a demonstrator in New York City for the late Alexander Fisher, at that time importer of the Rochet-Schneider. To Stricker's instructions, it will be remembered, Louis Strang attributed his success as a racing driver. The Mercedes pilot is expected to reach this country next week and will at once take up his quarters at Mr. Graves' racing garage at Mineola.

The Vanderbilt Cup Commission is scheduled to meet to-day. Mr. Vanderbilt sailed yesterday and is due to arrive early next week. Important developments are expected to follow close on the heels of his coming.

The New York Club's contest committee is making extravagant claims for its proposed race at Savannah under European rules. Its chairman seriously puts forth the statement that the entry of 15 cars by foreign makers is assured. The only actual paid entries so far seem to be three Fiats, but claims of entries promised by other importers are made and that the nominations of three Garfords, a Stearns, a Lozier, a Chadwick, an Acme, and a Pennsylvania are assured.

"If all those European racing cars are actually to be on hand," remarked an American maker, "then it strikes me that American manufacturers who send stock cars way down to Savannah with strong chances of being merely 'also rans,' are fit candidates for the easy mark class. The chances for efficient demonstration and wide publicity on a metropolitan course offered by the Vanderbilt race are so incomparably greater than the remote possibility of scoring against the foreign racers at Savannah that I marvel at an American maker hesitating for a moment in making his choice."

LOWELL'S INTERNATIONAL LABOR DAY ROAD RACE

LOWELL, MASS., Sept. 1.—Until next Monday evening this city will be the center of motoring interest in New England, and the citizens are already basking in the illumination of publicity which even their world-famous cotton mills could not bring them. It remained for the automobilists to bring Lowell into the public eye by means of the 250-mile road race which is to be held Labor Day on a ten-mile circuit in the outskirts.

When it was first proposed to hold a race the citizens were a little slow in taking to the idea, but when President John O.

Heinze, Vice-President Frank S. Corlew and other officers of the Lowell Automobile Club overcame seemingly insurmountable obstacles and at last made the race a certainty, the people took up the idea with enthusiasm and they are preparing to entertain a host of visitors on Monday. Capacious grandstands have been erected to seat the spectators, and the transportation companies are preparing for the biggest rush they ever experienced.

Nine cars are now entered for the race for the Butler Ames trophy. Of these six are American and three foreign.

The domestic manufactured competitors are two Knox machines, to be driven by Charles Basle and William Bourque; two Buicks, to be driven by R. Burman and C. S. Smith; a Simplex, to be driven by Frank L. Lescault, and an American, to be driven by A. J. Andrews.

The foreign competitors are two Isottas and a Fiat. The Isottas will be in the hands of Louis Strang and Alfred Poole, two of the Isotta team in the Briarcliff race. The Fiat driver is George H. Robertson, who drove a Panhard in the Briarcliff.

Most of the machines are already on the course, arrangements having been made so that they could be used for practice early each morning. The road has been put in good condition, the corners banked and the surface oiled. About half the course is over the boulevard, where the going is fine and upon the

straight-away stretches of which maximum speed can be made. The rest of the circuit is made up of good country highways and city streets. There are enough difficult places to make the race exciting and to try the best of drivers. There is a hairpin turn and several sharp right-angle turns. The whole course has been wired off and the club proposes to collect an admission fee of nearly everybody who sees the race.

The police are coöperating with the club in the patrolling of the course, and Monday there will be strong details at the most congested points. For the remainder of the course special deputies are being sworn in. There will be a telephone circuit around the course and the usual couriers and flagmen. There are no railroad crossings, and at the point where the street cars touch the course the service will be discontinued while the race is in progress.

SAN ANTONIO'S "12" WON BY STODDARD-DAYTON

SAN ANTONIO, TEX., Aug. 29.—The 12-hour endurance contest held on the fair grounds track last Saturday was won after some fast work by David Pryor's Stoddard-Dayton, with Studebaker and Mitchell as runners-up. The track was only



Stoddard-Dayton Winning the 12-Hour at San Antonio.

three-quarters of a mile long, and without banking at the corners, but good time was made and no accidents marred the day. It is believed that the twelve-hour race will become a popular form of contest, as it is almost as good a test of endurance as

the 24-hour, and has the advantage that it is all run during daylight hours, rendering the lighting of the track unnecessary.

Five cars started when the gun was fired at 7 A. M. The Stoddard-Dayton, driven by De Hymel, a youth of only 18 years, took the lead at the start with a fine burst of speed, and then settled down to a regular schedule, covering lap after lap in 1:10, without varying more than two-fifths of a second. At one time he had a lead of 35 laps over the nearest competitor, but this was reduced to about nine at 5 P. M. on account of tire trouble. From then on he gradually drew ahead until at the finish he was 14 laps to the good. The Chalmers-Detroit roadster made the fastest lap, in 55 seconds, but sprung its rear axle and was withdrawn to avoid an accident after covering only 94 laps. The Studebaker put up a good race and finished only 14 laps behind the winner, in spite of the fact that it carried a touring body and had only 30 horsepower to the Stoddard's 45. The score was kept on Burroughs adding machines. Each time a car crossed the line the judges called out its number and the scorer pushed the lever of the corresponding machine. This method proved entirely satisfactory, and not the least whisper of a protest was heard. The summary follows:

Car.	Owner.	Driver.	Score.
45 h.p. Stoddard-Dayton..	David Pryor..	De Hymel....	574 laps
30 h.p. Studebaker.....	Staacke Bros.	Van Tine....	560 "
30 h.p. Mitchell.....	D. G. Robbins	W. A. Marsh.	539 "
20 h.p. Mitchell.....	D. G. Robbins	Withdrawn*..	174 "
40 h.p. Chalmers-Detroit.	A. Calkhurst..	Withdrawn†..	94 "

*Ignition trouble.

†Sprung axle.

MOTOR RACING ASSOCIATION INCORPORATES.

New York tradesmen interested in the promotion of the two-days' race meet at Brighton Beach, September 11 and 12, have incorporated the Motor Racing Association with a capital of \$2,000.

The full complement of 16 starters in the 24-hour race, which is to be the star feature of the meet, seems assured. Harry S. Houpt, New York agent for the Thomas, has promised his associates to supplant the two Thomas cars ordered withdrawn by E. R. Thomas, with two machines of his own, one a stock car to be taken from the floor and the other the machine which Montague Roberts drove victoriously in last year's 24-hour race at Brighton Beach.

It transpires that two men of considerable prominence in their A. A. affiliations appeared among the officials on the entry blanks. One of them was Charles Jerome Edwards, president of the Long Island Automobile Club, who was named as a referee; and Charles J. Swain, of the Quaker City Motor Club, who was set down for a judge. Both are absent on pleasure or business trips. Both, on being informed of the use of their names, made haste to send declarations that they were used without authorization.

CAMERON AND BUICK IN LIGHT CAR RACE.

Two more American makes of light cars are assured of representation in the race for this class the Automobile Club of America proposes to run on the day before its contest at Savannah for big cars under European rules. A 4-cylinder Buick will be driven by Edward A. Hearne of Chicago. The Cameron Car Company of Beverly, Mass., writes that it will enter one or more air-cooled cars as it believes that for the first time in the history of competitions of this description, an opportunity is afforded "to demonstrate to the public and trade the relative merits of air- and water-cooling systems for use in light cars." There is a call for a light car race on the Vanderbilt Course, and one may be arranged.

A BUILDING LOT FOR A RACE PRIZE.

WILDWOOD-BY-THE-SEA, N. J., Sept. 1.—The Labor Day meet of the Motor Club of Wildwood will doubtless attract all the owners of fast cars in the East, who will come with the object of pulling down a neat bit of plunder in the shape of a \$1,000 Wildwood Crest building lot (all improvements made), which the Race Committee has hung up as an incentive to speed.



Striped Silk Rubberized Auto Coat with Auto Silk Veil.

What the Fair Autoist Now Wears

WHILE the enthusiastic autoist never really loses interest, it is everywhere acknowledged that the real season for automobiling begins in September. And so widespread has become the active interest in automobiling throughout the country, and so numerous are the members of the gentler sex who can intelligently discuss the merits and demerits of a car, and do not hesitate to undertake a long tour through a section of country of which they know little aside from the facts that its roads are rough and its inns of uncer-

tain quality, that it is not surprising that the question of suitable garb should have become one of vast importance. Certain it is that the woman who wishes to travel in comfort appreciates the necessity of providing herself with an outfit which will not only perfectly protect her from dust and cold, but will enable her to always present a smart, trim appearance.

For the earliest weeks of Autumn, when the days are still warm, the best sort of motoring coat is one of the rubberized taffetas or English mohairs, which are to be found in every imaginable shade and pattern, notably the wide stripes and checks now considered so smart in tailored suits. These coats are made up in various ways, although invariably long and loose, but not so roomy as to utterly disguise the lines of the figure, as was the case in the earliest models. There is, however, a marked change in the sleeves of the newest coats as compared with those made a few months ago, which it behooves every woman to carefully note. This change is due to the very radical differences between the gowns of this year and last—the Directoire influence having so marked an effect upon the sleeves of every garment that to wear anything savoring of the balloon order is to frankly announce one's self as being behind the times—from a sartorial viewpoint. This

is not saying that automobile coats have tight sleeves, for that would be an absurdity that no woman of taste would tolerate. The majority of them, however, are of the modified coat order and are put into the armhole without an atom of fullness, precisely as are the sleeves of the coats worn by men. Beyond this feature and the fact that pockets are larger and more prominent than heretofore, these rubberized medium weight garments show few changes, for the satin and silk neckties worn last Spring are still in evidence and so are the contrasting satin insets on the collar and cuffs.

In the realm of cloth motoring coats, there are several fabrics employed which heretofore have not been in general use for that purpose. One of these, and a material, by the way, which is considered immensely smart abroad, is the rough-faced English tweed in London smoke gray which has almost invisible stripings of black, and another is chinchilla cloth which, while undeniably a cold-resister, is rather too weighty to appeal to some women. The cloth motoring coats are of both three-quarters and full length, and a feature of their treatment is the perfection of the tailor-finished edges and the manner in which the bulk is taken from about the hips by means of the cleverly sloped side forms. While the cloth coat, like the lighter one of mohair and silk, has double-breasted fronts, its back may be made many inches narrower and in fact many of them are almost semi-fitting, although not in the least suggesting tightness. Some of these heavy cloth coats, and especially those brought over from London and Paris, have detachable hoods and capes of the same material, so that in some climates they will do duty all winter, especially if the cape, as is often the case, is fur lined. A coat which is a compromise between cloth and fur, in that it possesses attributes of both types, is a heavy double-faced English tweed made on the conventional lines of the ulster and supplied with an exceedingly high collar lined with otter and wide cuffs of the same fur. This is an ideal garment for mid-autumn and cold evenings, as the throat and forearms—most vulnerable parts of the body—are adequately protected.

The woman who is nearly related to the owner of an automobile and yet has not the income to warrant the purchase of a varied assortment of long coats, would best purchase a practical garment of rough cheviot, which may be worn on street, railway,



New Veil in Two Sections.



English Tweed Coat.



Hip-Length Sweater.

steamer or motor. Naturally such a utility coat should not be very weighty, owing to the discomfort of walking about in it and the fatigue involved by carrying it. Nevertheless, it may be very smartly lined throughout with striped silk or satin, have one of the new deep hoods, tassel trimmed, and a detachable shoulder cape of several sections. To provide additional warmth when necessary, every woman contemplating a motoring trip should provide herself with a sweater. The latest designs in these garments are so attractive, and withal so practical, that they will instantly appeal to the woman who wishes to be garbed becomingly as well as comfortably. These auto sweaters, as they are termed, actually extend half way to the knees and cling so closely that their presence is not detected even underneath a semi-fitting coat. The daintiest of these are in white with dark brown or blue borders, which also furnish the color scheme of the turn-over collar and deep, closely-fitting cuffs.

For some occasions, such as a race meet or a hill climb in a fashionable locality, it is necessary to wear a hat of as dainty

character as possible, commensurate with the sport. Many women, after long—and costly—experiments with motoring headgear, have fallen back upon the dust and rain-resisting Panama, which is also incrustable and so flexible that it may be bent wherever desired. They will continue to be worn until snow flies. Their most effective trimming consists of scarfs, ribbon choux, wheels or bows, all secured with Japanese pins, or merely fancy feather clusters.

The smartest motoring headgear is undoubtedly the visored cap which precisely matches the coat, but the most comfortable and the type much affected at this season by women who take long tours is the silk baby hood over which is tied a mask veil fitted with isinglass eyes. The double veil is now so generally used with motoring garb that almost every woman knows that it must be so arranged over the hat crown that there shall be four ends—one pair falling forward and the other backward. When these are crossed there is no possibility of the hat becoming disarranged even in the strongest wind.

TEXAS ABOUNDS IN IDEAL NATURAL MOTOR PARKWAYS

MIDLAND, TEX., Aug. 31.—It is only three years ago since Midland saw its first automobile, and now there are 41 owned here by official count, with the prospect that this number will be more than doubled by the end of the year. The majority are touring cars, and are used to carry family parties, mail, and groceries to and from the outlying ranches. "Outlying" means anything from 20 to 150 miles away from town. But who would not want to own an automobile when he can drive 98 miles over an absolutely level stretch of road without an obstruction as large as a pebble? Such is the Lone Star auto route to Seminole, Tex. This is not merely the name of a road, but of an official mail route as well. It was established September 16, 1907, and has not missed a daily trip since, which helps to explain some of the chief charms of the auto roads of this part of Texas, as they are in equally good condition the year round.

The car carries five sacks of mail a day, and Seminole now gets letters in five hours that formerly took seventeen. Other routes are to Shafter Lake, Andrews, and Monument, N. M., the first-named now getting mail within nine hours that formerly took two days. The pony express may be still an attractive feature of Buffalo Bill's show and still retain its romantic side, but it is very much out of date in this part of Texas now. Throughout the entire distance to Seminole the surface of the road is just sufficiently sandy to prevent the formation of mud after a rain, and there is not a single bog hole or creek to cause a halt. Midland has another star auto road besides the one to Seminole; it leads to Five Wells ranch, Gaines county, and is 45 miles long.

The stunts of the old pony express riders are mere child's play beside the everyday performances of R. L. Slaughter, Jr., a 16-year-old boy who sees that Uncle Sam's mail pouches are safely carried between Midland and Seminole. The trip is made once a day in each direction, consuming five hours, or an average of about twenty miles an hour. There may be no holes and no creeks, while the lack of stones is remarkable, but there are fences and a barb wire fence is not the easiest thing in the world to take an automobile through by any means. Up in the Panhandle end of Texas there are auto stages, too. One of them runs to Roswell, N. M., and it has to cross quite a few barb wire fences. To get over them, what are probably the cheapest and easiest erected bridges for the weight to be carried that can be found in this country, are built. They simply consist of two light troughs built of planks, and sloping up one side of the fence and down the other.

Young Slaughter of Midland knew of the bridge plan, but did not like it, so he invented a fence crossing of his own. At every barb wire barrier a pit, six feet deep, four feet wide and eight feet long, was dug, the pit running in the same direction as the length of the fence. Across it are laid two planks, measuring 2 by 10 inches, an upright, or flange, being nailed to the inside

edge of each plank to prevent the car leaving its track. The planks are laid on the same level as the road on either side, so that there is no necessity for slowing down as is the case where the car has to climb the fence. It is a hair-raising experience to make one of these crossings at full speed. With the car going at a good 25-mile an hour gait, which is much faster than most trains run in western Texas, a barb wire fence appears dead ahead. There is no gate or passage, and one begins to wonder how the car is going to get through. Then the pit with its narrow planks looms up and even the tough-as-hide cowboy bites his cud hard and sits tight waiting for what is going to happen. A flash and the front wheels of the car are on the narrow boards, and practically before one has a chance to look down into the pit the crossing is behind and fading in the distance. It seems so easy after it is all over that the passengers think it is a good joke, but there are fifty such crossings between Midland and Seminole, and the first time he makes the trip the passenger feels worried every time he sees one of them. Although these crossings are always taken at high speed, there is no record of a car ever having been piled up in one of the pits.

The ranchman is beginning to appreciate the automobile, and dozens are now used by owners of ranches living anywhere from thirty to eighty miles from Midland, making regular trips back and forth three or four times a week. As a result, Midland now has three good garages and a fourth is in sight, while the next development will be an automobile club. Plans are now on foot for an auto stage line from Seminole to Roswell, N. M., a distance of 268 miles from Midland. Both of the towns will carry out its share of the work; 160 miles of the route are already in use, so that it is expected that autos will be running through from Midland to Roswell in a few months. After that Midland autoists will try to establish connections with Dallas and Ft. Worth.

YE SCORCHERS OF YE OLDEN TIMES.

A correspondent of the London *Times* found this entry in the records of Parliament under the date of June 10, 1816:

"The attorney general moved for leave to bring in a bill, the object of which was the protection of the lives and limbs of His Majesty's subjects by correcting the enormous abuses of stage-coach drivers. Within these few days it would be hardly credible what a number of applications he had received on this subject. Some of the accounts were enough to freeze one with horror. A gentleman of veracity had informed him that on Tuesday, the 21st of May, at 5:30, the Trafalgar and Regulator coaches set off from Manchester and got to Liverpool twenty minutes after 8, doing this journey in two hours and fifty minutes at the rate of twelve miles an hour."

Doesn't it sound familiar?

THE DIRECT INJECTION OF MOTOR FUEL

By THOS. J. FAY, E. E., PRESIDENT SOCIETY OF AUTOMOBILE ENGINEERS.

WHILE it is true the direct injection of fuel into the combustion chamber has not been favored in the past, it is something of a question if, in the course of events, this mode of the utilization of fuel may not be taken up. Irrespective of the fact of its future application, there are points of interest to be noted, and it will be advantageous to discuss them. In order that the matter may be better understood, it will be necessary to go back over the ground, as it will be remembered that carburetion was a very serious matter from the start.

Earlier attempts to employ liquid fuel were in connection with carbureters of the "lake" type, in which a pool of liquid fuel was so situated as to intercept the inflow of air, with the expectation that the air would become saturated with the hydrocarbon and thus become an explosive mixture. Expectations were realized, in a way. The air did pick up the hydrocarbon, and the mixture was to a certain extent adaptable. It was not uniform, however, nor was it possible to utilize all the liquid fuel put into the receptacle at any one time, for reasons that we now know more about.

Nature of the Distillate Was Largely Responsible.

To begin with, it will be necessary to discuss the characteristics of the fuel used, to understand why all of it was not picked up by the air as it passed over or through the fuel, as the case may have been (there were several detailed methods), on its way to the combustion chamber. The fuel exclusively used at that time was of the "olefiant" hydrocarbon series, distillates of crude oil, in fractional form. The product was delivered on a basis of specific gravity, and the lighter distillates were selected for the purpose. The lighter distillates afforded the most uniform mixture, and it was then thought that the failure to realize a uniform mixture for all the gasoline in the container was due to the failure of the vendors of the gasoline to deliver what the specifications called for.

The fundamental difficulty was overlooked, for the most part, on account of lack of knowledge of the peculiarities of the fractional distillate, and, furthermore, in consequence of the very crude nature of the devices used. It dawned upon the pioneers in the course of time that the fractional distillates of crude oil were defective for the purpose, in that the components were not all of the same degree of volatility. The more volatile portions were carried over first, during which period the carburetion was the most perfect. Then the mixture would become "leaner," and trouble would be rendered manifest.

By the time half the gasoline was vaporized the remaining portion would be so resistant as to render further action futile, and the motor would cease to perform its functions. Various designers resorted to diverse means to overcome the defect, but to no avail. It was in 1896 that the author took up the task of correcting the defects of the methods as here set down, only to find just what is here related, i.e., the fault was in the gasoline, not on the basis as suspected by the then designers (failure to receive the gasoline of a specific gravity as ordered), but on a basis of difference in volatility of the components of the distillate.

Less Volatile Components Can Be Utilized.

One of the very first schemes for correcting the evil may have been the invention of "Raymond" (the author is not positive). The plan consisted in "spilling" the gasoline over a brass wire mesh, rolled up into cylindrical form, and causing the air to pass over and through the wetted wire mesh. For stationary work this scheme was the best of the time, insofar as the author can discern. The gasoline was pumped from a low to a high level and spilled over the wire mesh, while the excess ran back by gravity to the lower tank. The wire mesh was inclosed in a glass tube.

Even this scheme, as will be readily seen, failed in part, because the less volatile portions of the distillate would go by time after time, and in the end the residue piled up to a vast extent. At such a time, to remove the whole of the remaining gasoline and substitute a new supply was the only remedy. When the principle of the float-feed carbureter dawned on the minds of the engineers who were struggling with the ills of the earlier schemes it was at once to be seen that the less volatile products would be impelled with the more desirable portions into the combustion chamber. This proved to be a lasting benefit, and while the float has been done away with in certain types of carbureters, the principle remains, in that all the gasoline is passed into the motor.

It was thus proven that the less volatile products would serve as fuel were they properly handled, and in the main the value (relatively) was a matter of heat units contained in the fuel. It has been shown that the hydrogen component is of the greatest importance in the fuel, in that the increase in hydrogen rendered it possible to speed the motor, considering a given compression, because fuel rich in hydrogen possesses a low temperature of inflammation relatively to the other products of the compound. It is easy to see how hydrogen rendered the mixture easy of ignition and of a high rate of the flame propagation under conditions of high speed in which, unfortunately, the compression recedes.

The compression in the earlier types of motors was lower than it is to-day (1908), but the reason was well under the surface. The fuel of that time was richer in hydrogen than it is at the present time. The mixture ignited more readily and the flame propagation was more marked. Ignition troubles led to a higher compression. With higher compression the fuel problem was modified to some extent, but it is still an ever-changing bugbear. Because the fuel is not stable, either in the matter of quality or price, designs are influenced to a greater extent than one would be led to suspect.

Effect of the Height of Carbureter Float.

Liquid fuel is really delivered on a basis of its boiling point, and not with respect to its specific gravity. Volatility, then, is the measure of quality, since the calorific value does not vary very much in the several products as delivered. The difficulty likely to be experienced, in view of the method of procedure, lies in the fact that the limits of the boiling over (fractional distillate) process may not be so closely held as to assure reasonable closeness of volatility as between the components of the composition. In view of this and other facts to be disclosed lies the interest in the question of the direct injection of fuel into the combustion chamber of a hydrocarbon motor. At the present time, and just so long as the float-feed type of carbureter is used, the specific gravity of the fuel must be considered on the ground that the level of the float depends upon that very property of the fuel.

There are those who say it matters very little if the fuel stands high or low in the nozzle, since it will be sucked out anyway, and in a small degree they are justified in their belief, but it does matter if the fuel runs out of the nozzle and "floods" the carbureter. It counts primarily because it upsets the even tenor of the mixture, and it wastes fuel. The float can be set for any gravity of fuel, but it is not easy to change it from day to day, or even on rare occasions, to suit the vagaries of the fuel situation. The direct injection of fuel would obviate this trouble once for all, as the injector would be dependent upon the bulk and not upon the weight of the fuel.

It is not the intention here to elaborate upon the details of design of injectors, such as might serve the purpose of forcing liquid fuel into the combustion chamber of the motors. It will be enough to here disclose the fuel characteristics in so far as

they influence the situation in favor of the direct injection of the fuel, rather than its vaporization before use. In the first place, the fuel is not vaporized in the present types of carbureters. It is sucked out of the nozzle in a stream, and is carried along in the path of the air current, subdividing as it passes along and reaching the combustion chamber in small globules, with, perhaps, some vaporization of the more volatile products of the composition, while the less volatile portions hold to the globule formation with a good deal of tenacity.

Indeed, the suction process guarantees that the spraying phenomenon (so much desired) will not be realized, for that condition is peculiar in forcing a liquid not aspiring it. The extent to which the globules will hold to their form will depend upon the length of the intake, the pressure, temperature and time. The time is short in practice, the impelling force is barely adequate to set up the motion, and the temperature is low.

Liquid Fuel Acts as a Refrigerant.

All the conditions to be found are such as to assure the practical absence of complete vaporization. In some designs this ideal is more nearly realized than in others. The temperature of the intake is low, for the reason that liquids in changing to the gaseous state act as refrigerants. Considering the three states of aggregation of all elements and compounds, *i.e.*, solid, liquid and gas, it must be considered that a heat exchange attends the transformation of such elements and compounds as can be changed from one to the other of the three states. Refrigerants, as the term is generally understood, are compounds, such as ammonia, carbonic acid, sulphur dioxide, etc., in which the heat exchange is attended by a considerable lowering of the sensible temperature as the liquid compound is evaporated into the gas formation. The temperature of ebullition in the case of refrigerants must at atmospheric pressure be the temperature of the surroundings, just as it is with the more volatile hydrocarbon products. Gasoline is not commercially valuable as a refrigerant for the reasons given, but it is a refrigerant nevertheless, as evidenced by the lowering of the temperature in the intake.

In mixing gasoline with air the process involves the evaporation of the gasoline; it must be deprived of its latent heat. This is not merely a matter of mingling the gasoline with the air, since the latent heat must be abstracted from the gasoline by the air before the liquid will change to the gaseous form. This takes time, of which but little is available in the interval between leaving the nozzle and entering the combustion chamber. The specific heat of air is low, and as a result the globule of gasoline must come in contact with many volumes of air before the specific capacity of the air will equal the latent heat value of the liquid gasoline. All these, and other conditions tend to thwart the good intentions of designers.

One other point to be emphasized is that gasoline as it is sucked out of the nozzle of the carbureter, made up, as it is, of hydrocarbons of differing values, from the point of view of weight and volatility, will hold to the globular form with greater or less tenacity, depending upon whether conditions are pronouncedly one way or the other. It should be noted that doubling the diameter of these globules increases their surface four times, but their bulk will be increased *eight times*. Evaporation is proportional to the surface, but if double the quantity resides under a given surface, double the time must be taken to gasify the liquid, subject to a correction in that the spheroids are reducing in diameter as the vapor expands.

Demonstrating the Action of the Nozzle.

There is no better way to find out the difference as between the nozzle performance under a vacuum and the performance of the same nozzle if pressure be applied than to watch the nozzle in a carbureter during the operation of a motor, and as against this put pressure on the same nozzle by any suitable means. With the vacuum it is a stream; with the pressure it is a spray—that is, provided the nozzle is suitably shaped. An ordinary gasoline torch has more carbureter philosophy in its

humble makeup than can be found in most special devices costing overmuch and intended to prove out some theory.

With the torch it is easy enough to observe that liquid will survive the flame. All that is necessary to do to show this is to shoot the flame at some obstruction in juxtaposition. The liquid will be sprayed against the surface and the flame will not capture all of it.

The reason is, as before stated, that the latent heat of the fuel cannot be abstracted by air quickly enough to vaporize the liquid fuel, partially because the air is of low specific heat, and, again, because of the law of the sphere, in which, as before stated, eight times the volume can hide under four times the surface, if the globules be doubled in diameter.

Thus far the treatment of this subject has been, comparatively speaking, superficial, in that the future prospects are to be influenced by other and very material considerations. Hydrocarbon liquid fuels up to now have been comparatively low in cost and much more uniform in point of volatility than can be hoped for in the future. The specific gravity has been more uniform than it will be in the future. The divergence of the components in the fractional distilling process will be extended, in all probability. In other words, the limiting temperatures between which automobile gasoline will be tapped off will be wider; the product will include more of the components of the hydrocarbons. In the torch test more will shoot through the flame and land on the obstruction without taking fire at all.

This increase may be charged to a phenomenon in connection with hydrocarbon fuels that has ever been present, to at least some extent, at any rate. The time required for evaporation is not the same with all the compounds in the makeup of the fuel, and the inflammability is influenced differently with a given air dilution for the several compounds.

If, then, the several compounds are intermingled indiscriminately, it will be found that some of them will ignite readily, others with some difficulty, and more with considerably increased difficulty. The torch will show this, since the compounds that will not ignite readily will shoot through the flame and be impinged on the surface of the obstruction. Within the era of fairly uniform hydrocarbon fuels stratification was merely suspected. When the compounds entering the fuel are widely divergent there will be more than a suspicion of the presence of this undesirable phenomenon.

Essential Elements of Direct Injection.

In the chapter on "Available Fuel for Automobiles," to appear later, the time constants of the compounds in the hydrocarbons will be given a measure of attention. Here it will be enough to point out that the direct injection of fuel is not attended by the troubles so characteristic of the carbureter, for the reason that the fuel is positively pumped into the combustion chamber. There may be troubles of quite another sort to be expected, in view of the fact that nothing of moment will be entirely free from complication of some sort; there would be no place in the world for engineers without it.

In the direct injection of fuel it is apparently necessary to time the injection and carefully measure the weight of the fuel injected, in view of the quantity of air admitted. It must be borne in mind, as well, that the completeness of the combustion will be a measure of the relation of the injector (pump) to the air valve. The quick and complete combustion of the fuel cannot be effected with what may be termed "the right amount of air." There must be an excess, and unfortunately the magnitude of the excess is variable, depending upon the compounds in the fuel, their relative proportions, and the compression, assuming that the spark is properly timed. The time constant of the flame propagation is not the same for the several compounds entering into the hydrocarbon fuel. Were but one compound used, the time would only change with the *richness* of the fuel and the degree of compression, assuming a corresponding temperature due to compression.

The structural problems then will be difficult of solution if the results are to be better than those realized in the cases in-

volving correctly designed float-feed types of carbureters. It will be extremely difficult to fix the relation of the injector to the air valve; regulation for load changes will be equally a problem, and harmonizing for speed changes will be something to ponder over as well. That the direct injection of fuel will prove to be impossible is a matter that will not need second thought, for the simple reason that it is an accomplished fact, and has been for several years. None of the fuel problems can now be regarded in other than the light of refinements.

Why "Explosive Mixture" Is a Misnomer.

The great question of the future is one of high weight efficiency of the motor and high fuel efficiency, to be realized by properly supplying the fuel in conjunction with an adequate supply of atmospheric air (diluted oxygen). Indeed, it will probably never be possible to consider the use of pure oxygen in this work. Pure oxygen costs over much, and to add it directly to the fuel would be attended with danger, since the mixture then partakes of the characteristics of what may be properly termed an explosive. It is not uncommon to hear the mixture used in the internal combustion motor called an explosive mixture, but it is not properly such. Explosives are possessed of the elements necessary to their complete combustion in the absence of any outside supply of oxygen, and the rate of flame propagation is high in comparison with motor fuels. The piston of a motor cannot travel fast enough to get out of the way of an explosive mixture. This the author found out in a manner that might be termed emphatic, when some years ago it became fashionable to use B. B. DuPont powder in a cartridge inserted in a breech-lock mechanism fixed to the combustion chamber for starting, to obviate cranking, especially the larger sizes so difficult to get in motion when cold.

The scheme worked very well except in the hands of men who did not care to go through the operation twice, which became necessary on very cold mornings when the crankcase oil was of the consistency of molasses. On such occasions it was not uncommon to catch such men in the act of throwing a handful of powder into the chamber before inserting the cartridge. The plan was abandoned after a few disruptions, and especially upon being able to procure an indicator that would give a card of the curve of pressure that the blasting powder developed. Apropos of oxygen, some fuel mixtures have this element in their composition, and, in consequence, are somewhat more lively in their flame-propagating characteristics.

Fuel is relatively quick burning, but it is not an explosive in the sense that gunpowder is. Unfortunately, the fuels we are able to procure are mere mechanical mixtures of several distinct compounds of carbon and hydrogen (in the main), and each compound has its own time constant.

Bearing in mind the fact that the injector, to be as nearly perfect as possible, will have to be so designed as to supply fuel at the right time and in the right proportion, it will be necessary to discuss one more phase of the subject, a phase, in

fact, beyond the pale of carbureters of the float-feed or any other known type, as they exist at the present time.

Fuels in the three states of aggregation will range as follows: (a) In the gaseous state they occupy the maximum space for a given mass; (b) in the liquid state the bulk is a minimum, differing but slightly in this respect from fuel in the solid state; (c) fuel in the solid state is nearly of the same bulk per pound as the liquid fuel, but the solid fuel is in more acceptable form in some respects, in that it will not evaporate, nor will it form an explosive until melted and combined with air (oxygen).

Solid fuel would be very troublesome in connection with the present types of carbureters, and it is the positive pump (injector) that would seem to lend itself to the purpose, if we are to consider solid fuel.

The latter is probably best represented by naphthalene, which is one of the aromatic hydrocarbons, and is an extract from coal tar. In naphthalene we have the nearest approach to the direct utilization of coal in the internal combustion motor. The cost of production should be very low.

It would seem to be unnecessary to point out that all the other products of the process involving the production of naphthalene from coal have a stable market, and there would be no over-production of the one or the other were naphthalene used in vast quantities in automobile motors. It is not too much to say that this fuel would quickly take the place of gasoline, at a third or less cost, were its satisfactory utilization a settled matter. The direct injection process is what holds forth the most promise in this connection, since to melt the solid fuel would be easy enough were it not for the fact that present types of carbureters demand a constant viscosity of the liquid, which could not be assured in the use of solid fuel, since maintaining a constant temperature would be very difficult.

Considering the direct injection of the fuel, it would not matter so much if the fuel were very hot or quite viscous (within limits), since the positive injection of fixed quantities would satisfy the demands; at all events, more nearly than the carbureter handles the liquid fuel of the present time. Naphthalene is especially suited to the positive injection process because of its characteristics, as high-vapor tension is pronounced. If a "fog" (very fine spray) is the ideal form of the fuel as it enters the combustion chamber, high vapor tension is the phenomenon that will assure the result.

The mixture of air with this hydrocarbon is readily ignited, according to the reports of those who have used the fuel, and the residue is not troublesome, as might be supposed in view of the high carbon content.

"Sooting" is not a feature, as it seems; nor do the polished surfaces of the cylinders show any deterioration as the result of the use of this fuel. In conclusion, then, it is plain to be seen that the direct injection of fuel offers possibilities, not only by way of a remedy for present defects, but by way of the use of a far cheaper fuel possible of supply in unlimited quantities.

SOCIETY OF AUTOMOBILE ENGINEERS TO MEET AT CLEVELAND

CLEVELAND has been set as the place for the third quarterly meeting of the Society of Automobile Engineers this year, and the dates will be Friday and Saturday, September 18 and 19. The Hollenden House will be headquarters, and the program as already outlined, will devote considerable time to visiting the numerous important automobile manufacturing plants located in Cleveland. The entire morning of the first day will be given over to this, followed by a lunch to be arranged for by the local committee, consisting of James G. Sterling, chief engineer of the F. B. Stearns Company, chairman; H. B. Anderson, of the Winton Company; F. B. Stearns, and H. W. Alden, of the Timken Roller Bearing Company, Canton, O.

The afternoon will be devoted to the business meeting and the reading of papers, discussion, and the like, and there will be a dinner in the evening, to be followed by a continuation of the technical session. On the second day a train will be taken to Akron for a visit to the Goodrich and Diamond tire plants in that city, and the visiting members will be the guests of the Diamond Rubber Company at a lunch to be given at the Akron Country Club. Following this, the trip will be made to Canton, where the society will visit the plant of the Timken Roller Bearing Axle Company's plant, and the members will be the guests of the latter company until their departure from Canton in the evening, the meeting formally ending in that city with the visit to the Timken plant.

USEFUL POINTERS FOR MAN WHO DRIVES

A CONE clutch whose leather has become glazed from use can be releathered with a piece of belting of suitable thickness and cut to shape. The first thing to do is to measure the thickness of the old leather to the nearest thirty-second of an inch, taking the leather off for this purpose. The new leather is not likely to be required more than 1-32 of an inch thicker than the old leather, since the wear is very slight. Straighten out the old leather on a sheet of paper and measure to see what width the belt will furnish a piece of approximately the same curvature. Since the leather will stretch slightly it is not essential that the pattern of the old piece should be followed absolutely. On the other hand, if the new piece is too straight it will bulge on its smallest diameter between the rivets and will not fully release when the pedal is depressed. The new piece of belting should be carefully selected for uniform thickness throughout. The new leather is cut from it about 1-4 inch short, and is punched and countersunk at the ends for the rivets. It is then soaked in water for 3 or 4 hours, causing it to swell and soften. Meanwhile a cup-pointed rivet punch is procured, also a short square-ended rod small enough to bear against the rivet heads when they are countersunk in the leather. When the leather has finished soaking it must be applied to the clutch before it has time to dry, else its shrinkage renders it unmanageable. First one end is riveted in place, using two rivets, and the other end is brought around and temporarily held in position by rivets or wire nails. Then the opposite portion of the strip—half way between the ends—is stretched into place and marked and punched for the middle rivet. A wire nail is stuck through to hold it, and the remaining rivet holes are located and punched in the same manner. When all have been punched they are countersunk, using preferably a flat-pointed countersink made for the purpose, though a sharp pocket knife will answer. The rivet heads should be at least 1-32 inch below the surface of the leather. The leather is now riveted fast, following the same order of procedure as in locating the holes. In case the work takes longer than 1-2 hour it will be well to keep the leather wet, particularly if difficulty is experienced in stretching it sufficiently. On drying the leather will grip the clutch cone very tight. When dry it should be given a thorough soaking with neatsfoot oil, and the oil treatment should be repeated whenever the clutch gives signs of gripping too harshly.

Strange Noise and Its Cause.

A curious incident which lately befell the owner of a small four-cylinder touring car may be of interest to others. He had bought his car—a high-grade one—at second-hand after three years of service, and had personally overhauled it and put it in satisfactory condition. The engine had been found to be in good order, but as a precaution the gears, which were separately enclosed in an aluminum housing at the front of the engine, were exposed and examined. The engine was oiled by splash with two feeds to the crankcase and one to the governor case—enclosing the gears—from a combination mechanical and sight-feed oiler. The oiler frequently failed to pump, and the crankcase was then fed by a hand pump, and melted grease and oil were injected occasionally into the governor case by disconnecting the oil pipe. One day while the owner was visiting friends some miles from his home an ominous noise developed about the engine. It came and went in pulsations, which became more pronounced when the throttle was opened; and it was neither a grind nor a scrape, though it strongly suggested both. It seemed to come from the front part of the engine, and the fan and fan shaft ball bearings were investigated without result. The power did not seem to be affected, and the only conjecture the owner could make was that one of the gears he had recently examined had slipped endwise on its shaft and was grinding away at the alum-

inum casing. There was no immediate opportunity to examine the gears, and a 40-mile spin was taken with the friends aforesaid. Before the 40 miles were over the noise had become almost continuous and was alarmingly increased in volume; and the owner drew a long breath of relief when the ride had ended without sudden casualty. On depositing his friends he took the car at once to a garage, and, aided by a helper, dismantled the headlights, front mud guards, radiator and radiator cradle in order to gain access to the plate covering the gears. To remove the cradle from the frame it was necessary to slacken the two lateral bolts holding the front side arms of the crankcase to the side members of the frame. This permitted the frame members to be sprung apart sufficiently to release the cradle. At this point it was discovered that the left hand front engine-to-frame bolt was already loose. The space inside the channel was filled by an aluminum casting which met the crankcase arm. The reaction from the explosions produced a lifting action at this point which overcame the weight of the engine, and the aluminum casting was itself free to shake. It was instantly suspected that here was the cause for the noise. Nevertheless, the gears were exposed and examined to make assurance doubly sure, and, as anticipated, they were found in perfect condition. On reassembling the parts with the bolts properly tightened, the noise was banished. If the true origin of it had been suspected at the outset it could have been corrected in three minutes. It must not be inferred from this that a loose engine-to-frame bolt will always result in such disquieting symptoms as those just described. If the aluminum casting had been a snug fit in the frame most of the noise would have been prevented, and the bolt might have broken off before the much less audible thumping of the crankcase arm on the frame had been traced to its real cause. Cases have been reported of small two-cylinder engines, suspended crosswise at the front of the car, shearing their frame bolts nearly through or breaking them off entirely before the owner suspected anything wrong.

Care of Sprocket Chains.

It is rather common, especially in cars with planetary gear chain transmission, to see the sprocket chains drenched with oil and thickly covered with dirt. The oil itself is naturally not objectionable, but the dirt draws the oil as fast as it gathers, and, since the oil causes it to cling, it abrades the teeth of the sprocket wheels. It must be admitted that the proper treatment of sprocket chains is less easy than slushing them with oil. As outlined by the chain makers and motor car manufacturers, it is to detach the chain, say once in 500 miles—oftener would be better—soak it for several hours in kerosene and wipe as clean as possible; then boil it in mutton tallow to which a liberal supply of graphite has been added. When the chain is taken out after the tallow has had ample time to enter every crevice, it is wiped as clean as possible, so that it will not catch the dust more than can be helped. It is then brushed clean at the end of every day's run. The brushing process calls for a jack, but if the right kind of a brush is used it need not take more than a few moments. A convenient brush may be made by wiring three bicycle chain brushes side by side.

A Case of Overheating.

A 30-horsepower four-cylinder touring car once developed a stubborn case of overheating which puzzled the owner for several weeks. The pump was inspected and found in good order; the carburetor was readjusted and the fan belt tightened, but still the overheating persisted. Finally the cause was discovered in the gaskets between the water pipes and the cylinder castings, which had melted and spread until they nearly closed up the openings. A few minutes' work with a sharp knife settled the trouble for once and all.

Editor:
[1,526]
chanical
where I
know if
My mec
of auto
a driver
say it I
I do not
bles ha
is no lo
gressed
the rea
would a
Mt. V

We s
care of
single c
owner's
to hand
shop, th
much m
The fro
car in
designer
essentia
though
conveni
placing
type of
unit, or
on whic
nowada
In case
remove

INFO:
Editor

[1,526]
mobiles
method
machin
as unde
ected,
reason
transmi
Phila

Belts
sorrow
ties, ha
the exa
thing s
mission
proache
cycles
differen
machin
a chair
is to d
pensed
connect
driven.
a certa
There
gether
ticular
is emp
from b
almost

LETTERS INTERESTING AND INSTRUCTIVE

IS THE PRIVATE PIT ADVISABLE?

Editor THE AUTOMOBILE:

[1,525.]—Being possessed of more than the average run of mechanical ability, and contemplating the erection of a private garage where I can house and take care of my own car, I would like to know if you consider a pit an essential part of such a building. My mechanical knowledge has been gained in lines other than that of automobile repairing, and while in the early days the sight of a driver lying underneath his car was quite a frequent one, I must say it is something that I have not noticed now for a long while. I do not know whether this is altogether on account of the automobiles having been improved to such an extent that similar attention is no longer necessary, or whether the development has only progressed to a point where this can be given in a garage, and this is the reason why it is no longer done on the street. In your opinion, would a pit justify the expense entailed in making it.

Mt. Vernon, N. Y.

ENGINEER.

We should say that the construction of a pit merely to take care of such repairs of this kind as would be necessary on a single car, would be a needless expense. Even where it is the owner's intention to effect repairs of every kind within his ability to handle with the facilities available in a small private repair shop, the construction of a substitute for a pit is so easy and so much more economical as to place the latter out of the question. The frequent necessity for lying down in the mud beneath the car in former days was largely due to the fact that American designers favored the horizontal type of motor and many of its essentials could not be conveniently reached in any other way, though probably it is somewhat of a misnomer to use the word convenient where crawling beneath a car is concerned. The placing of the motor forward, and the tendency toward a unit type of design in which the gear-set is either a part of the motor unit, or is combined with the rear axle has made the occasions on which it is necessary to get beneath the car so rare, that nowadays neither a pit nor a substitute is considered essential. In case of a repair to the propeller shaft, it would be easier to remove the body of the car.

INFORMATION WANTED ABOUT BELT DRIVES.

Editor THE AUTOMOBILE:

[1,526.]—Can you tell if belts have ever been employed on automobiles for the transmission of the power, and if not, why such a method is not perfectly feasible. Belting is employed for driving machinery under the most severe conditions, out of doors as well as under cover, and as the belting on an auto could easily be protected, as is most of the machinery now, there seems to be no reason why it should not be a practical solution of the problem of transmission.

Philadelphia, Pa.

INVENTOR.

Belts have been used on the automobile, and usually to the sorrow of its driver. The German Benz cars back in the Nineties, had a belt transmission, and not a few others have followed the example of these pioneers, only to give up the use of anything so frail and uncertain as leather and canvas for the transmission of the power under conditions which cannot be approached by any other form of service for severity. True, motorcycles still employ belts to transmit the power in a number of different types, but, in our opinion, this is the weakest part of machines of that class, and they would be far better off with a chain. In fact, the tendency throughout engineering practice is to do away with the belt altogether wherever it can be dispensed with, and machines that cannot conveniently be directly connected to the source of power, are now very largely chain-driven. The latter is positive and at the same time permits of a certain amount of flexibility through the looseness of the chain. There is no good reason why a transmission using chains altogether to give the different speeds would not be feasible, particularly where a chain of the "silent" type, such as the Renold, is employed, but in the light of present design, it would be far from being a practical and commercial success, as the tendency is almost entirely to the shaft-driven type of car.

A BRIEF FOR THE THREE-CYLINDER.

Editor THE AUTOMOBILE:

[1,527.]—Your answer to Mr. Ellis, on page 229, issue of "The Automobile" of August 13, does not seem to me to accord with the facts. The customary three-cylinder engine has its cranks at 120 degrees apart, and this is an even spacing, and therefore just as well balanced as can be. It can be shown both by trial and mathematically that when there are two pistons moving in one direction they are moving slower than the third and so are balanced by it. The power impulses follow each other in regular sequence and are thus balanced. The only thing not balanced worthy of mention is the movement of the whole engine in its plane due to the flywheel being by one end only. This is somewhat more perceptible than with a two-cylinder and cannot be partly overcome by having two pistons at the ends move together, as it is partly overcome in a four-cylinder.

With pistons of decent weight, this movement is negligible and even in a light vehicle, the three-cylinder engine can serve so well that it is impossible to tell whether it is a three or four-cylinder by the feel of the riding. And this is the final test. Of course, if a buyer wants the biggest thing on the street, he is not satisfied with three cylinders, but must have six or eight; not that these numbers are appreciably better than five or seven, but that he may have more than common. And why he should stop at eight I do not see. If there is virtue in quantity, why not go to the limit? Ten will run more smoothly than six and no flywheel is needed. And think of the long bonnet needed to cover ten cylinders. It could be used for a bedroom in a pinch.

But if a man wants the golden mean that gives the maximum advantage with the minimum complication and cost, it seems to me he must stay nearer to a sane number of cylinders. The success which the one-lungers have given is too well-known to be lost sight of. But the single cylinder does not balance, and this is its objectionable feature. We must have at least two. If four cycle, they must be opposed to both balance the pistons and impulses and the opposed engine has some objections, so the next number is the three-cylinder. This is the least number that balances the parts and explosions and it has all the advantages of compactness and suitability that the four-cylinder has. It is slightly less steady but it has one set of parts less. The reduction in number of parts is far greater than the loss in steadiness of running.

This will readily be understood by comparing a few engines. The single-cylinder of a given power gets but one impulse in two revolutions. It is the maximum of simplicity and vibration. Two cylinders for the same power balance each other, thus wiping out that source of vibration and dividing the impulses by two, both as to size and time, so that the vibration therefrom is but one-fourth as great as with the single-cylinder. Thus doubling the parts decreases the vibration by more than 75 per cent. This is a gain worth while. When we add another cylinder we get balanced parts as before, so there is no gain there, but we get three impulses of 1-3 the power in a given time and so each is but about 1-9 the original effect.

This is more than cutting them in two and with the other advantages of the multiple cylinder form, such as simple piping, juxtaposition of plugs, single camshaft and similar reasons, is sufficient to pay for increasing the number of cylinders to three. But the four-cylinder engine gains nothing except a slightly better balance. The difference between 1-9 of a given shock and 1-16 is so slight that the average rider cannot tell it with certainty and so it is negligible; but the difference between keeping three and four cylinders in order, oil and spark is 1-3 and the cost is more than the gain. This is why I believe in three cylinders for four-cycle engines and two cylinders for two cycles. These numbers are the least that will give the multiple cylinder effects. I have never seen a three-cylinder motor with 180-degree shaft except in compound form. Six-cylinder engines are simply two threes, so there is nothing wrong with 120-degree shafts.

CHARLES E. DURYEA.

Reading, Pa.

We cannot say that we have ever seen a three-cylinder, four-cycle engine that had its crank pins placed, two in one plane and the third 180 degrees away, but our statement in the reply to the letter in question, was to the effect that regardless of whether the cranks were spaced equally round the circle as in the 120-degree arrangement, or as just mentioned, the impulse balance was far from being as good as could be obtained with the four-cylinder engine. This, we think, is in accord with the facts, and are further of the opinion that it is borne out by your own letter, in which you state that the difference between 1-9 and 1-16 is negligible, the latter representing the decrease in

vibration brought about by the addition of an extra cylinder. In view of the high compression and high speed now currently employed in automobile motors, it strikes us that this matter of more than 40 per cent. difference is quite the reverse of negligible. In fact, to regard it as such is almost on a par with an alleged automobile designer who is said to have marked the representation of a hole on a drawing "nearly 3-8 inch." Trying to make a good fit of a 7-16-inch bolt in that hole would appear to be about equivalent to stating that a difference of 40 per cent. or more in the vibration was a negligible quantity. Of course, the actual quantity itself is small, and stating it in percentages is frequently misleading. Further than that, the fact that a jury has convicted a man of a crime does not mean that he may have been actually guilty of it; merely that they think him so. Thus the great number of users of four-cylinder motors may not actually mean that it is so far superior to the three-cylinder that the latter has been forgotten completely, but merely that they think it is. But the thinking so seems to be equally effective in both cases.

WHAT ARE THE DRAWBACKS OF CONE CLUTCHES?

Editor THE AUTOMOBILE:

[1,528.]—I have noticed that during the past three or four years there has been a constant tendency away from the old conical type of clutch with its leather facing, and in favor of the multiple-disc type. However, this seems to have been largely the case, at any rate as far as my observation extends, with new makers in the field, and with old-established makers where they brought out new models. Despite this general tendency, for it certainly does seem to be very general, some of the most prominent makers still stick to the cone clutch, so it seems to me that there must be something more than the reasons which appear on the surface for its retention in one case, and its abandonment in favor of the multiple-disc type in the other, particularly as the later type of clutch is much more expensive to build, although the later fact does not appear to prevent its adoption on low-priced cars.

By way of enlightenment, both for myself and doubtless a great many others who are equally interested, will you briefly sum up the good and bad points of the leather-faced cone clutch? I have driven a car equipped in this manner for three years now and I have had very little occasion to find any fault with it, nor have I had to go through the long list of ills that so many of your correspondents detail concerning their experience with their cone clutches.

Toronto, Ont.

As was the case with practically every other essential of the automobile of early days, many mistakes were made in the design of the first cone clutches, so that their refusal to work satisfactorily was not the result of there being an inherent defect in the principle, but lay almost entirely in their design. We say "almost entirely," because a development that has since come into existence has had a great deal to do with the improvement of the cone clutch since, and that is the cork insert. Many of these early clutches were designed with an improper angle of contact, then again, the spring pressure was insufficient, or in the case of a clutch of large diameter, improperly applied, though the most prolific source of trouble was the manner in which the clutch was mounted on the car.

Frequently, the side members of the frame were depended upon to some extent to preserve the alignment of the motor, clutch and gear-set, and where insufficient means were employed to permit the clutch to center itself in the flywheel automatically, regardless of its relation to the gear-set, it was not to be wondered at that trouble followed after the car had been in use a comparatively short time, as the frame either received a whack that put it out of true, or it sagged sufficient to give rise to ills that were nearly always traced to something else. Needless to add, the correction of the latter did not in turn correct the ill.

Given the correct angle of contact, a proper mounting that will permit the clutch to center itself in the female member regardless of its relation to the other essentials of the transmission, the leather-faced cone clutch will be found very satisfactory, and it can readily be made of such small diameter and of such weight that its inertia will not interfere with gear-changing. Another source of trouble on early cars, was the leakage of lubricating oil out of the crankcase, and this found

its way along the crankshaft and onto the facing of the clutch where it naturally destroyed the friction properties of the leather against the cast-iron and caused such an amount of slipping that the clutch often became virtually useless from this cause. This gave rise to the use of numerous applications, such as rosin, talc, fuller's earth and the like, which, of course, were nothing more than makeshifts. Better design has served to eliminate this source of trouble to a very large extent, while the adoption of cork inserts, the coefficient of friction of which is not influenced by oil, did away with it entirely, beside effecting a vast improvement in the conical type of clutch as a whole. This, together with the fact that their clutches were probably better designed in the first place than many of the others, accounts for the retention of the conical type by some of the best known American makers.

But there has been another factor at work, where the adoption of the multiple disc type of clutch is concerned, and that is that it can be said to merit the term of "fool-proofness" to a much greater extent than any other, and, moreover, it does not require anything like as much skill to handle it properly as does the cone clutch. In other words, it takes a better driver to handle a car with a cone clutch than one with a multiple disc, especially at the outset, before the peculiarities of the car are known by the driver. The ability to run a multiple disc clutch constantly in oil is another factor of great importance in its favor, and as the discs may be made of small diameter and very light, the inertia effects are reduced to a minimum.

WHAT IS THE CAUSE OF THIS DRIPPING?

Editor THE AUTOMOBILE:

[1,529.]—I have a Rapid car and have been having considerable trouble with my carbureter, which will drip constantly after the engine is stopped. I have lowered the float and finally bought another carburetor of the same make, but with the same results. The system is of the float-feed type. If any of your readers can help me out, I will appreciate it very much, as the dripping is not alone wasteful, but is also dangerous.

Miami, Fla.

WALTER WALDIN.

As you do not say just where the gasoline drips from, nor how long it continues after the engine has stopped, any diagnosis that we can make of the trouble can be nothing more definite than a conjecture. It may be due to capillary action, the level of the gasoline in the float chamber being so close to the opening of the nozzle that this goes on steadily, or it may be due to a poor adjustment of the carburetor, the engine getting a mixture more or less rich in liquid gasoline, which, while the motor is running, is consumed, but once it is stopped the amount that has collected in the manifold begins to collect and drip out. Lowering the float should prevent the former, while a correct adjustment of the needle valve to suit the demands of the motor for fuel should avoid the latter cause. It is quite probable that the trouble is due to neither of these, and if any of our readers have had a similar experience which puzzled them to the extent of investing in a second carburetor, they are quite welcome to explain the cause and the remedy they adopted, in these columns.

CONCERNING THE MILE CIRCULAR TRACK RECORD.

Editor THE AUTOMOBILE:

[1,530.]—I have seen lately in two different newspapers where Barney Oldfield made a mile in :29 on a circular track. This was made on a southern track, at Louisville, Kentucky, I believe. Traveling a mile in twenty-nine seconds is going faster than 120 miles per hour; this would be remarkable on a straightaway, but, as it said, this was on a circular track. This seems incredible to me, but to settle an argument I write you. What is Oldfield's fastest mile on a circular track?

Peabody, Kansas.

FRED E. PETTIT, JR.

This was evidently a misprint and intended for :59. Oldfield's best time for one mile on a circular track is :53 flat, and in view of the poor nature of the ground on most of the horse tracks, it is probably pretty hard to better this. It is not, however, the mile record, which was made by Christie in one of his front driven machines at St. Paul last year. This is 52 seconds.

A DIRECT READING AUTOMOBILE POWER METER

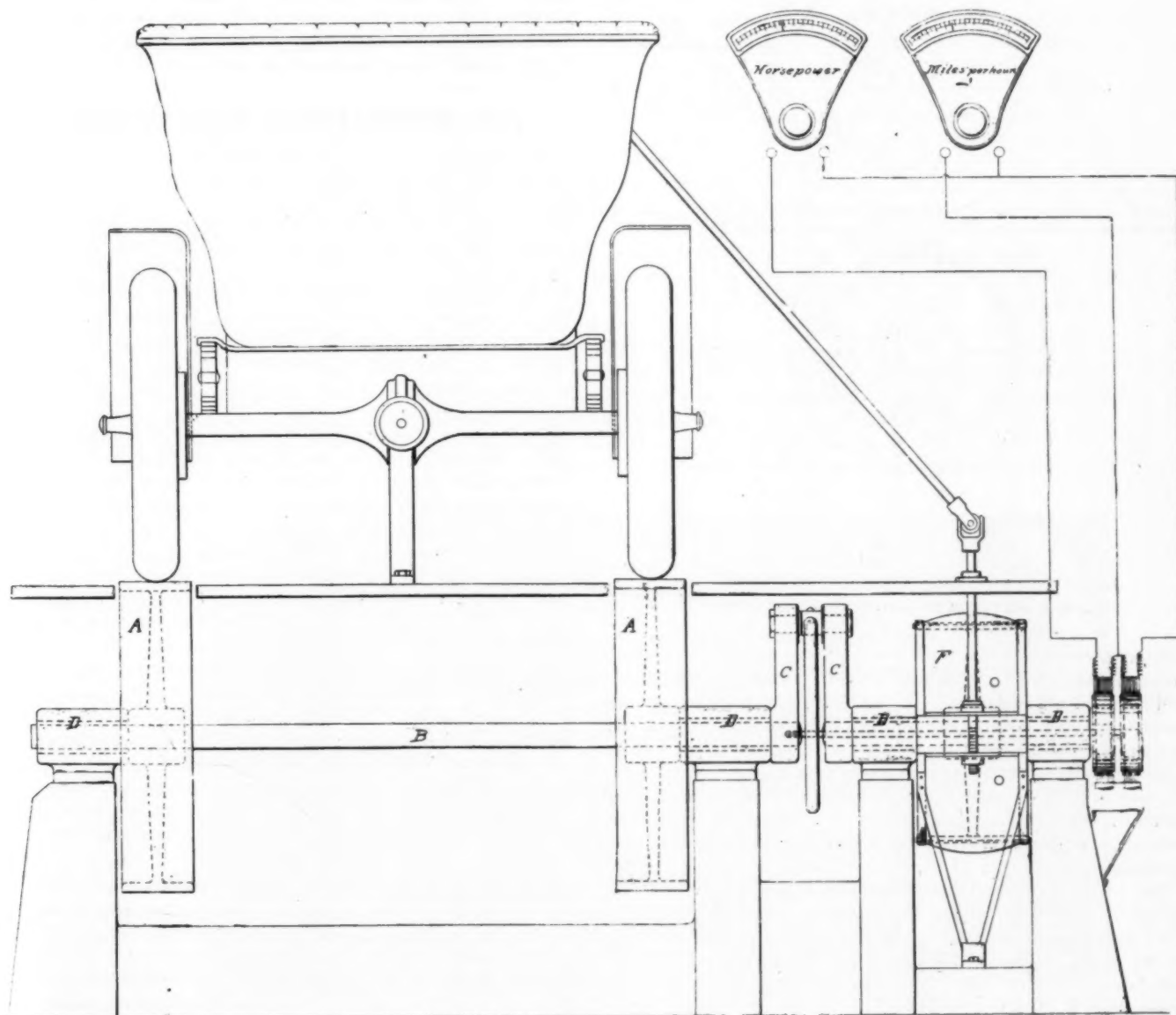
By PROF. J. W. ESTERLINE, PURDUE UNIVERSITY.

PROF. C. R. MOORE of Purdue University and J. Harris, of the Central Laboratory Supply Company, of Lafayette, Ind., have developed and patented a power and speed indicator, especially adapted for use in testing automobiles, which is unique in the fact that it indicates directly on a scale, without any calculations whatever, the horsepower developed at any speed and the speed in miles per hour. This instrument should be useful to manufacturers as a convenient method of testing the driving power of a finished machine, the test being easily and quickly made, without any changes being necessary in the automobile to prepare it. Such a method should be especially desirable in winter and when the roads are bad, and it has the further advantage that all parts of the machine are easily inspected during the test, as the automobile remains stationary. Salesrooms and garages will find it of value in demonstrating the power and speed of machines, as well as to test those which have undergone repairs. Members of automobile clubs will take interest in comparing machines, and in making power and speed tests for themselves.

The rear wheels of the automobile to be tested are run upon

two wheels (*A* in the drawing) spaced to correspond to the tread, and mounted on a shaft *B* beneath the floor. The front wheels are blocked, and the machine securely locked to a post in the rear. When the automobile is started, it itself cannot move, but it drives the two wheels *A*. To place a load on the engine an absorption brake *F* is connected to the end of the shaft. The power required to drive the brake is changed or adjusted by means of a hand wheel within reach of the operator.

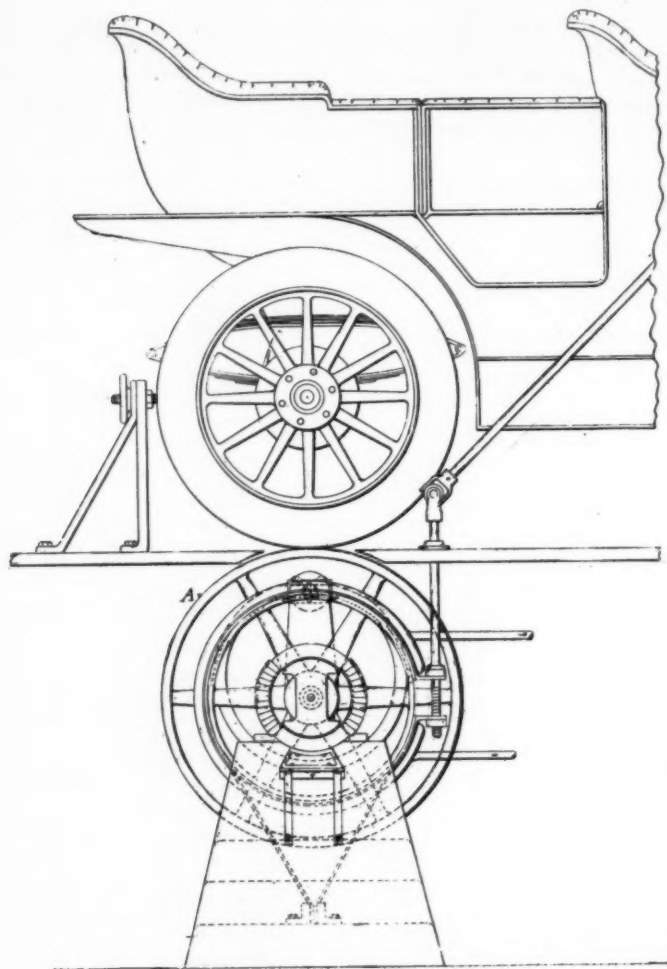
The ingenious part of the apparatus is the device which indicates the power. It is comparatively easy to make a power indicator which will show the power correctly at one speed, but to produce an instrument which will indicate the power delivered by the engine at any speed, is not so simple a matter. The power meter *E* is connected between the shaft *B* and the spindle of the brake. It consists of two discs *C*, one fastened to the shaft *B*, the other to the shaft of the brake, and connected by a spring. All of the power developed by the automobile is transmitted to the wheels *A* and the shaft *B*, then through this spring to the brake. The spring is designed so that twice the sine of half the angle of deflection is proportional to the torque de-



Sectional View Showing Elevation of the Moore-Harris Direct Reading Electrical Power Meter.

flecting it. When the brake is applied the spring is deflected by the power transmitted through it.

Connecting to each of the discs *C* is a small revolving field alternating current generator. The generators are exactly similar, and produce sine waves of voltage at the same potential. It is well known that when two alternating currents of the same voltage and wave form are directly opposed to each other no current will flow, but if the alternating waves are displaced, then a current will flow proportional to twice the sine of one-half the angle of displacement. The two generators are connected in opposition and so placed that they exactly oppose each other when there is no deflection of the spring between the discs *C*. A voltmeter is placed in the circuit between the two small generators. When no power is transmitted there is no deflection of



Side Elevation of Moore-Harris Power Meter.

the spring and no current flows, consequently the voltmeter reads zero. When power is transmitted by the spring it is deflected, and the two alternators are thrown out of step by an amount equal to the deflection of the spring. The torque is proportional to twice the sine of one-half the angle of deflection of the spring. Also the current through the voltmeter is proportional to twice the sine of half the angle of displacement of the two alternating currents, which is also the deflection of the spring, so that the current through the voltmeter at a given speed is directly proportional to the torque.

The horsepower transmitted is proportional to the torque multiplied by the speed. Likewise the voltage of the little generators also changes with the speed as well as with the deflection of the spring, so that increasing either the speed or the torque will increase the reading correspondingly. Therefore, the voltmeter gives a reading proportional to the product of the speed and the torque, i.e., it reads the horsepower transmitted. The

voltmeter, of course, is calibrated in terms of horsepower instead of volts. This is the only instrument of the kind which has been devised to read horsepower directly on a scale without any mathematical calculations whatever.

Further than this, since the voltage of either of the alternators alone is proportional to the speed, by connecting one of them directly to a second voltmeter, the revolutions per minute or miles per hour can be read off the scale.

The shaft, wheels, brake, etc., are all placed beneath the floor so as to be out of the way. The instruments for reading horsepower and speed can be placed on a table or mounted on the wall. The use of revolving field alternators for indicating the displacement of the spring does away entirely with contacts, brushes and moving electrical connections, which makes the apparatus reliable and unlikely to get out of order. The manufacturers, the Central Laboratory Supply Company, of Lafayette, Ind., also furnish recording voltmeters, which may be used instead of or in connection with indicating instruments, so that a complete record of the test is made. The range of the power meter can be quickly changed by removing the spring and inserting another of greater or less strength. The brake is supplied with an attachment so that if need be the spring can be quickly calibrated. All of the springs sent out with the instrument are standardized, so that this is seldom necessary.

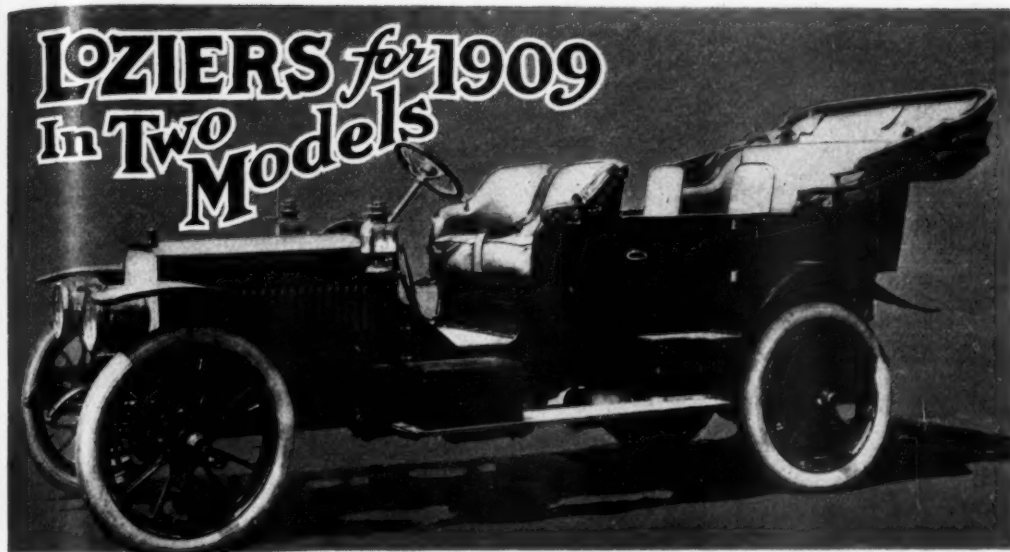
The use of the power meter is not limited to automobile testing, as it is being applied to the testing of gas and gasoline engines, steam engines, machine tools, dynamos and motors. However, its application to the urgent needs of the automobile field is timely, and it will doubtless prove to be a useful adjunct to the manufacturing plant and the salesroom.

THE INTERNATIONAL ROAD CONGRESS.

The program of the International Road Congress which will be held in Paris during the coming October, has just been sent out. The Congress will open with a reception on the 11th; on the 12th there will be a full meeting at the Sorbonne, followed by the opening of the exhibition in the Tuileries Gardens; the various sections will meet on the morning of the 13th and in the afternoon the delegates will visit places of interest near Paris. For the rest of the meeting the program reads: October 14, excursion to Versailles; October 15, meetings of sections; October 16, excursion to Fontainebleau; October 17, closing meeting; October 18 to 20, excursion to Nice and vicinity; October 21, visit to Monte Carlo.

The Congress will be divided into eight sections and altogether ninety-nine papers will be read, France contributing thirty-seven, Great Britain seventeen, Belgium fifteen, Germany twelve, the United States eight, Holland three, Austria and Switzerland each two, and Italy, Portugal and Russia each one. The subjects which will be considered include the materials used in road construction, means of preventing wear and dust, effects of automobile traffic, watering and oiling and signs indicating distances and dangerous turns and grades. Not only the wear and tear caused by automobiles on the roads but also the effects of various kinds of roads on automobiles and tires will be discussed, the Hon. C. S. Rolls being down on the program for a paper on the latter subject. Another paper will be read by Dr. H. S. Hele-Shaw, the inventor of the multiple-disc clutch. The American delegates will go under special instructions from President Roosevelt, whom they visited recently at Oyster Bay. The President expressed the liveliest interest in the work of the Congress, and hoped that it would be made permanent.

Emperor William has once again expressed his desire to see the proposed Taunus track take on more tangible form and has pointed out the gratifying financial results achieved at Dieppe as a spur to the parties lagging with their decision. It is naturally only a question of money, and the city of Frankfurt cannot quite see its way to take up the heavy obligations connected with the scheme.



Lozier Four-cylinder, Seven-passenger Touring Model for 1909.

WITH the passing of the season of 1908 the double side-chain drive ceased to be a factor in the Lozier construction, as the announcement of the Lozier Motor Company, Plattsburg, N. Y., for 1909 is to the effect that there will be but two Lozier models for the coming season, and both of them will be shaft-driven. As a matter of fact, both of these models have been on sale since July 1, and a number of them are already in the hands of new owners. Both are standard chassis, on which runabout, touring, limousine, or landaulet bodies will be mounted, the difference being that one is a four-cylinder model and the other a six, the motor of the latter being shown by one of the accompanying illustrations. The cylinders of both models are cast in pairs and finished in the manner that has long characterized the Lozier motor, *i.e.*, a pearl-gray baked enamel. Large covers are employed instead of making the water jackets almost entirely closed, thus affording easy access.

The engine base is of aluminum alloy, and is cast integral, with supporting arms and bed-plate extending to the side members of the frame, which are considerably narrowed, thus giving an unusually short turning radius for a large car. A cast-aluminum oil-pan completes the crankcase, and may readily be dropped to permit of inspecting the crankshaft or its bearing, the matter of doing this being strikingly illustrated by one of the photographs. The cylinder dimensions of the four-cylinder motor are 5 1-4 inches "square," while the six-cylinder dimensions are 4 5-8 by 5 1-2 inches, the motors being rated at 45 and 50 horsepower, respectively, according to the A. L. A. M. formula.

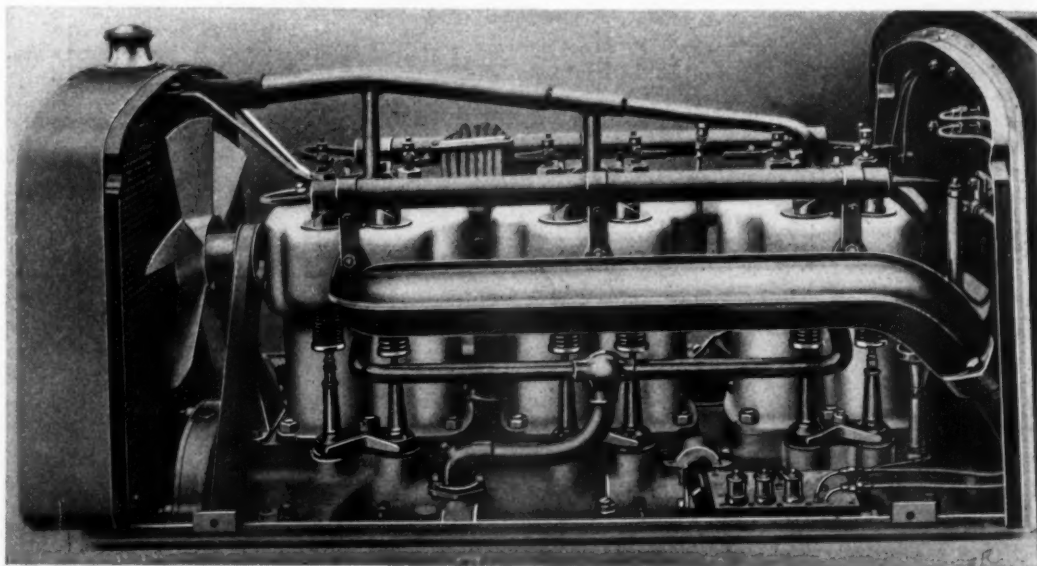
Valve disposition is of the outboard port type, two camshafts placed on opposite sides of the motor and inside of the crank case being employed. These shafts are made of one piece, with the cams integral, and are of special steel, which is subjected to a heat-treating process and ground on the cam faces to .001-inch. The valves themselves are of nickel alloy and are operated on the direct thrust plan, the valve springs be-

ing seated at their lower ends in cup lifters, thus insuring uniform downward push in seating the valve. The valve-lifter housings are fastened to the aluminum motor sub-base by means of yokes.

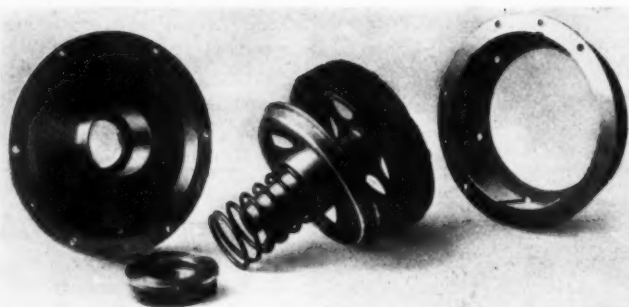
One of the most striking features of the 1909 Lozier cars is to be found in their crankshafts. These are forged from a chrome-nickel steel of the grade employed for armor-piercing projectiles, and each shaft is heat-treated, hardened and ground. In the case of the four-cylinder motor it is supported on four annular ball-bearings with very large balls, running between extra wide,

hardened straps. The remarkably high elastic limit of this crankshaft will be understood when it is claimed that when supported at the ends it will stand a dead load of 17 1-2 tons without permanent deflection, and it is due to this fact, and to the liberal size of the ball-bearings, that in the 1908 season there is not a case on record of a broken ball or loose crankshaft bearing, say the makers.

The entire lubrication is by splash, which is made possible by the universal use of ball-bearings in the camshaft, crankshaft, clutch, and all magneto and pump-drive bearings. The main reservoir, which is suspended from the chassis, contains three gallons. The working oiler occupies the space between the motor base and the frame, and contains four metallic piston pumps of the McCord type, the master pump drawing oil from the main reservoir to the working oiler, the next two throwing oil to the crankcase, and the fourth being merely a tell-tale, delivering oil to a single sight-feed on the dash, whence it returns to the reservoir. In the case of the six-cylinder motors an additional plunger pump supplies oil to the base of the third pair of cylinders. This system discards entirely the multiplicity of oil pipes usually found running to various plain bearings. The connecting rod lower bearings being, of course, of the plain white bronze type, are lubricated by a special U-section ring oiler, which receives oil from the splash and by centrifugal force



Off Side of Six-cylinder Lozier Motor, Showing Oiler and Pump.



Components of Lozier Multiple Disc Clutch.

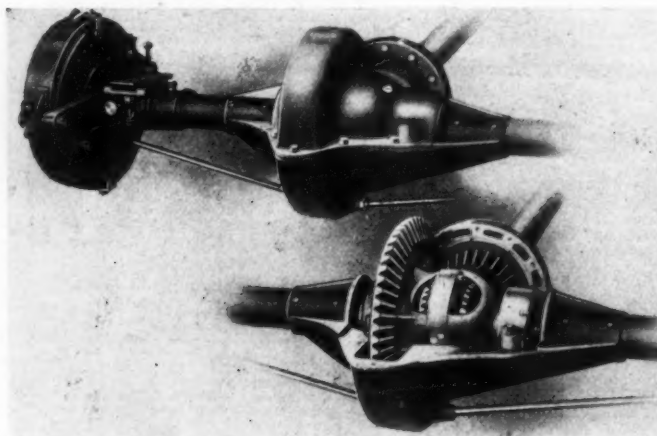
delivers it through interior channels in the crankshaft direct to the bearings. The pet cocks in the base and in the lower portion of the oil pan enable all the oil to be drawn off, while gauge cocks enable the proper level to be determined.

The carbureter is of the central-draft, float-feed, compensating type, with automatic auxiliary air intakes. An especially valuable feature of the carbureter is a variable needle valve, the needle valve orifice opening automatically with an increase in the speed of the motor. A new feature is a butterfly valve connected to a rod projecting through the radiator near the starting handle, to increase the air draft when starting a cold motor. The needle valve is located directly in the center of the float chamber, insuring a uniform gasoline level on the heaviest grades. The double ignition system, first introduced on the Lozier cars in 1904, is still employed without change—the Bosch high-tension magneto, as in the past, being the standard source of electrical energy, the magneto, plugs being located in the valve covers on the inlet side. The auxiliary system consists of a high-tension storage battery of 50-ampere-hour capacity.

The cooler is of the well-known Lozier design, containing 2,000 copper tubes. The retention of this type of radiator, while expensive, is compensated for by the manner of easy cleaning with a brush, and in case of damage to the radiator temporary repairs may be satisfactorily made by simply inserting corks in any of the damaged tubes.

Control is by means of the regulation spark lever and hand throttle on a stationary steering-wheel quadrant, the throttle being interconnected with a foot accelerator. The hydraulic governor has been discarded, as the other controls have been found to be all that is necessary.

A special feature of the clutch is the fact that it is mounted on annular ball-bearings. It is of the multiple-disc type, containing 33 hardened and ground discs of saw-blade steel enclosed and running in an oil-tight case. The clutch may be slipped indefinitely without danger of over-heating or wear, enabling the car, when desired, to be started from a dead standstill on the high gear. Clutches that have been in use for

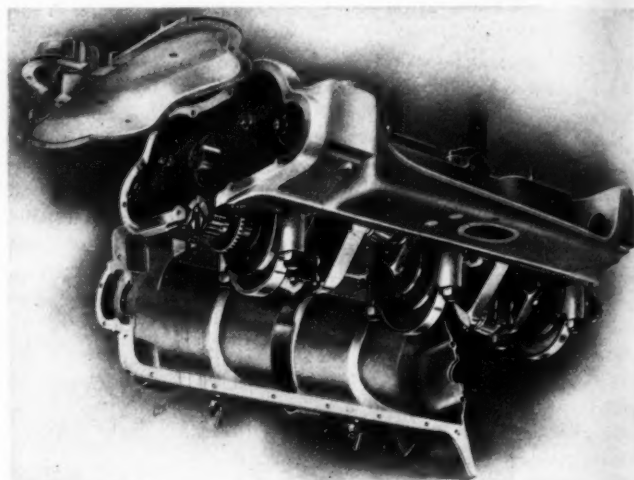


Two Views of the Rear Axle Driving Unit.

12,000 miles last season show no perceptible wear on the discs.

The clutch pedal is interconnected with the shifting lever, locking the gears when the clutch is in place. Thrust is cared for by a ball-bearing plate. The connections between the clutch-shaft stub and the forward end of the drive shaft on the car is by universal joint, consisting of an internal and external gear. A special feature of the Lozier car, adopted in 1906 and improved for 1909, is a clutch brake, retarding the rotary motion of the gears and tending to facilitate gear-shifting.

The gear-set, of the selective type—the standard construction of the Lozier since 1906—has four forward speeds and reverse, all shifts being made with one lever, third speed geared 3 to 1 direct with no gears whatever in mesh. The fourth speed is through gears having a ratio of 2 1-2 to 1. The inspection plate on the top of the case is removed by means of winged nuts, the bolts of which are connected at the lower end by hinges, so that they may be dropped out of the way without entirely removing the nuts. A threaded hand-hole plate allows of filling the case with oil without removing the entire top plate. All gears and gear-shafts are cut from chrome-nickel steel and mounted on annular ball-bearings. The gears are hardened by gas fur-



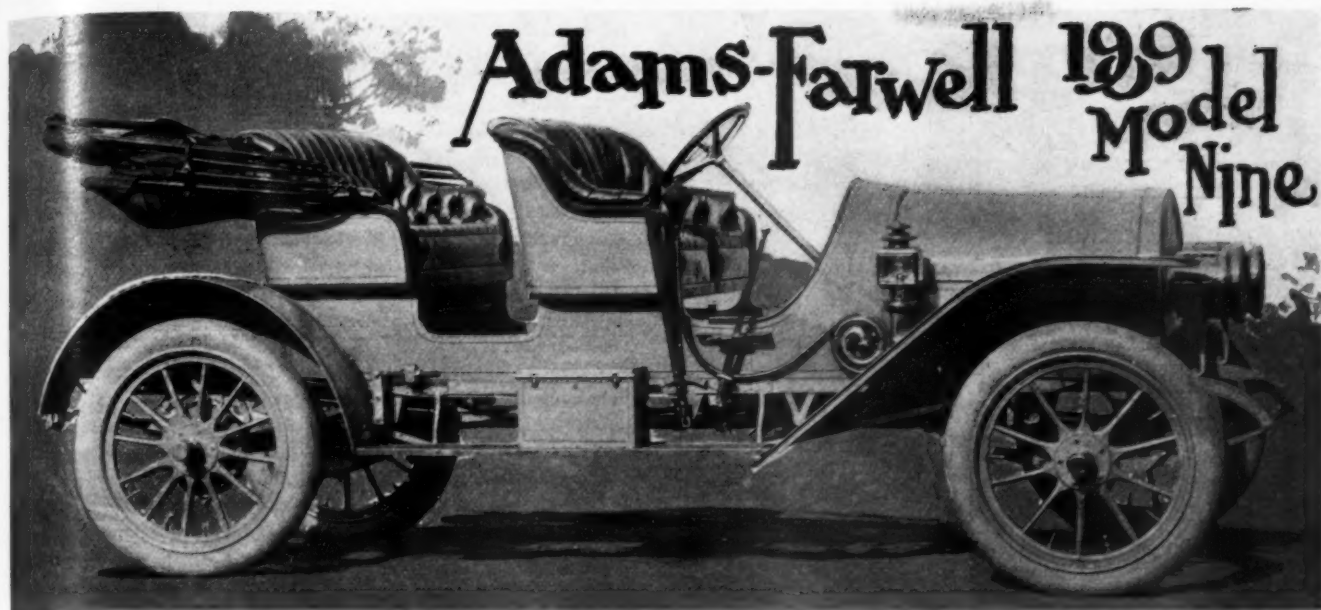
Accessibility of the Timing Gears and Main Bearings.

nace and pyrometer, and as there has been no case of a broken gear in 1908, this method of cutting and tempering gears remains unchanged.

Details of Shaft-drive Construction.

The propeller shaft of chrome-nickel steel is at a very slight angle to the horizontal, and in last year's cars the torsion rod was dispensed with—a distinct advance in cardan shaft construction. The torsion member now consists of a shaft housing bolted through to the differential case housing, ending at the forward end in a sliding sleeve joint with ball and socket member transferring the torsion to a cross-frame member. The differential is of the bevel type, large and ample, and the main drive bevels are unusually large. The final drive is of the floating type, the driving shafts being mounted on independent annular ball-bearings. As the differential main drive gears are supported on their own ball-bearings, the drive shafts may be removed independently.

The frame is of the drop type, to get ample spring and wheel clearance and low center of gravity, and is unusually narrowed in front to insure small turning radius. The middle section is very deep, and tapers at both ends. Special cross members carry the cooler and gearcase. The steering gear is of special Lozier construction, all parts being very large; the column is inclined 45 degrees from vertical. The cross link is positioned back of the front axle, and all connecting links are ball and socket adjustable joints. All wheels are 36-inch, 4-inch front and 4 1-2-inch rear tires. The wheelbase of the 45-horsepower four-cylinder car is 124 inches, the six-cylinder 131 inches.



The Adams-Farwell Four-passenger Roadster, Showing High Road Clearance.

IN the 1909 Model Nine Adams-Farwell, the product of the Adams Company, Dubuque, Ia., will be found all the novel features of the Model 7A which preceded it—features which, in fact, have characterized this car ever since its first appearance on the market in 1904. Of course, the central idea of the whole mechanism is the five-cylinder horizontal revolving motor. Although rather startlingly unconventional in design, this motor has been tested by many years' service, and, moreover, its employment results in a truly remarkable simplification of the various accessories.

As may be seen from the illustrations, the five cylinders are arranged like the five points of a star. In the center is the crankshaft, vertical and stationary, the five connecting rods interlocking upon its single crank. The crankshaft being held stationary, it is evident that, when an explosion takes place in one of the cylinders, the cylinders and crankcase will be forced to revolve. A bevel gear keyed to the lower side of the crankcase transmits the power to the change-gear, which is immediately beneath the motor. The first advantage of this unusual arrangement is the elimination of all reciprocating parts. The pistons merely swing around in a circle about the crank, eccentric to the circle described by the cylinder heads. The motor forms its own flywheel, the revolving parts amounting to about 90 per cent. of the total weight. Again, the revolving cylinders act as a centrifugal blower, and cool themselves automatically by the current of air they set up.

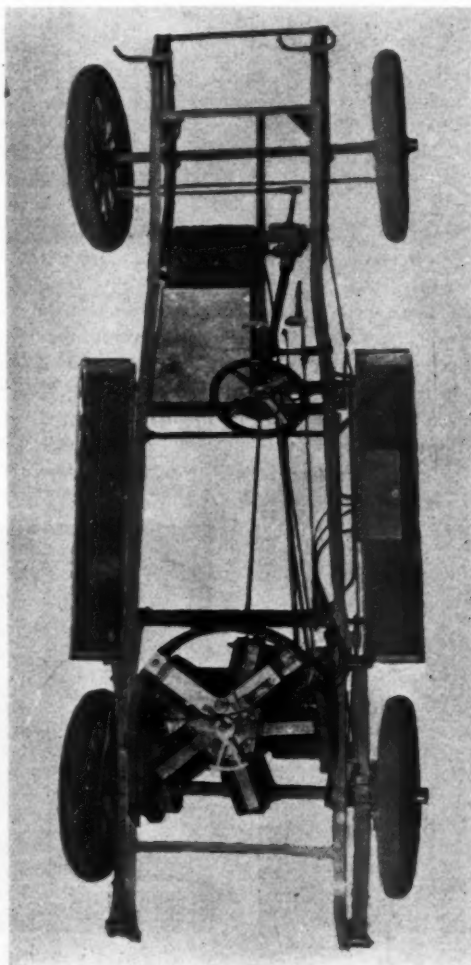
The valves are located in the cylinder heads, actuated by the now familiar walking beam with a single push rod. The push rods from all five cylinders, however, work on a single cam, concentric with the crankshaft, but caused to revolve at a slightly lower speed. The cam is made in two parts, which are movable with respect to each other, thus changing the profile. By this means the inlet valve may be held open during part

or all of the compression stroke, giving a range of compression between maximum, 90 pounds, and atmospheric pressure only. The speed of the motor is controlled in this way instead of by throttling. The larger part of the exhaust is discharged through auxiliary ports at the bottom of the piston stroke. As there is never a vacuum in the cylinders, owing to the absence of a throttle, there is no need for any kind of check valves on these ports. No muffler whatever is used, as the wide distribution

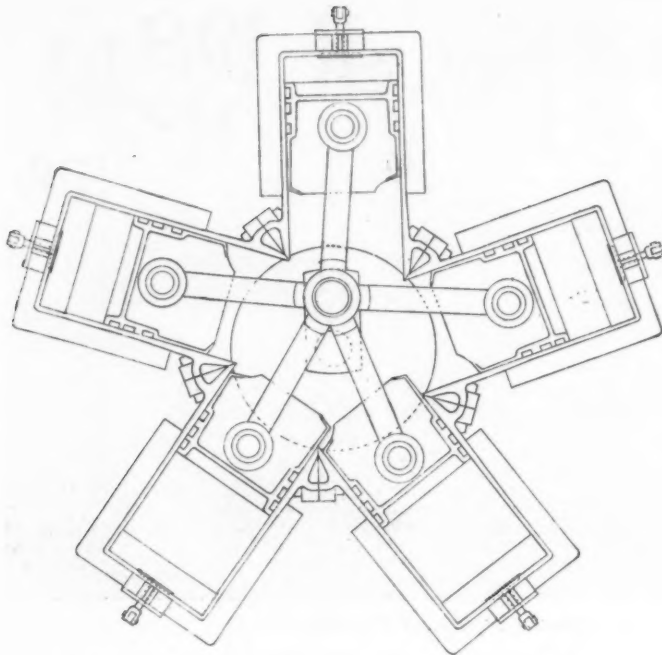
of the exhaust and the constant current of air rushing past the ports effectually break up the sound. Owing to the action of centrifugal force tending to hold the valves closed, the springs may be made very light.

The carbureter is stationary, on top of the motor, and consists simply of a spray nozzle, an air valve, and a pump which maintains the gasoline level without a float or air pressure. The inlet pipes are cast integral with the cylinders, and connect with the manifold which surrounds the upper end of the crankshaft; all are of course exactly the same length, so that an even distribution of the mixture is assured. One feature of the carbureter is that it may be taken apart and cleaned without disturbing the needle valve adjustment. With the variable compression system of control, there is never a vacuum in the intake pipes; rather, centrifugal force comes in again and puts a slight pressure on the gas. For the same reason, the motor can be run on a much thinner mixture than usual, as the richest and heaviest gas tends to collect in the cylinder head nearest the spark plug.

Considerable simplification is apparent in the ignition system, principally through the arrangement of the cylinders to act as their own secondary distributor. Each spark plug is connected by a wire to a fiber insulator near the base of the cylinder, and a screw in this insulator is adjusted to make contact with a stationary strip of



Plan View of Adams-Farwell Chassis.



Outline Drawing of Adams-Farwell Five-cylinder Motor.

brass to which the secondary wire from the single spark coil is attached. Thus each cylinder in turn picks up the spark as it passes under the brass strip. A timer, a single coil, batteries,

and four short wires complete the equipment. There being but a single contact point, any wear affects all cylinders alike, and they cannot get out of time.

The oiler is contained in the left leg of the V-shaped aluminum casting which extends over the engine and has its apex over the end of the crankshaft. It is driven by a worm gear and has no springs or check valves.

The only noteworthy change from former models appears in the change-gear. This was formerly of the four-speed type, driving indirect on all; but as the lowest gear was never used, it was changed to a three-speed type, driving direct on the high. The gears are controlled selectively by a lever working on an H-shaped quadrant. The clutch is a double cone, bronze on cast iron with cork inserts, running in oil; it is enclosed in a separate compartment of the change-gear case. As stated above, the change-gear is immediately beneath the motor, the whole forming a single unit, which is supported on a three-point suspension. Drive is by a single short chain to the rear axle. There is full 15 inches clearance under the middle of the car.

The five cylinders of the engine are 5 1-2 inches bore by 3 inches stroke, rated very modestly at 50 horsepower. The Model Nine is fitted with two types of bodies, a seven-passenger touring car and a four-passenger roadster; the chassis is the same except as to wheel-base, which is 128 inches for the former and 120 for the latter. Tires are 35 x 4 1-2 both front and rear. There is an unusual amount of storage room on both models, all the space under the hood and the front seat being available for this purpose. Another convenience which has for some time distinguished the Adams-Farwell is the self-starter, a ratchet device worked from the driver's seat.

MOTOR TRUCK DEMONSTRATES ITS ECONOMY

SYRACUSE, N. Y., Aug. 29.—An automobile truck in road construction work near here has furnished some remarkable figures illustrating the great economy of gasoline power over horse power. The truck is a three-ton Chase, made by the Chase Motor Truck Company, of this city, and is fitted with a special dumping body of 33-4 yards' capacity. Its work is hauling crushed stone from the crusher located near Skaneateles to a point three miles distant, where a road is in process of construction. It makes eight round trips every day, carrying a total of 30 yards of stone—about 40 tons. On this same work, teams are used at a cost of \$5 per day per team. The teams haul 1 1-2 yards at a load and make three trips a day, a total of 4 1-2 yards a day. The truck is consequently doing the work of 6 2-3 teams, and must be worth \$33.35 to the contractor.

In its daily operation the truck consumes 12 gallons of gasoline and 2 quarts of oil, costing \$1.64, and the driver receives \$2.50, making a total operating expense of \$4.14 a day. The de-

preciation on \$3,500, the cost of the truck, at 25 per cent., amounts to \$2.91 a day; interest on investment, \$0.70; liability insurance, \$0.20; maintenance and repairs, \$1.00. The total daily expense is therefore \$9.05 a day, and the contractor saves \$33.35 less \$9.05, or \$24.30 a day.

The Chase truck used on this work is two years old, so that the record is not that of a brand new machine, but rather the average figure of one that has seen hard service in various lines of work. Its work on this job is attracting considerable attention in the state engineer's office, as it promises to make a large reduction in the important item of haulage expense.

In making the trip from the crusher to the road work it is necessary to climb one hill a third of a mile long, with a maximum grade of 12 per cent. On this grade the horse teams frequently double up, using four horses to draw the 1 1-2 yards of stone. The truck climbs this hill with its full load mostly on the intermediate gear, using low gear only in the middle.



Distributing Crushed Stone Along the Road.



Chase Truck, Equipped with Special Dumping Body.

THREE 1909 MODELS OF THE POPE-HARTFORD

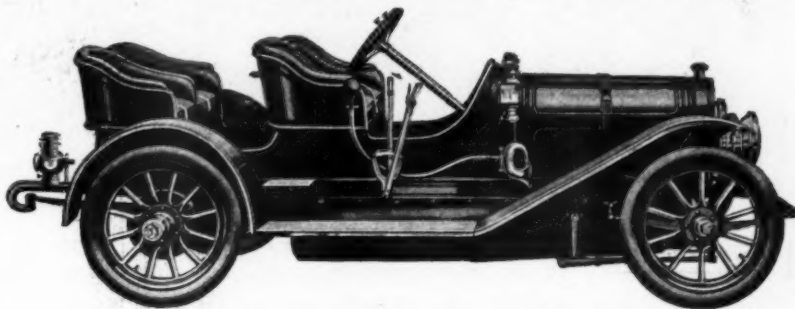
THE Pope-Hartford line for 1909 will consist of three types, built on practically the same chassis: a touring car, a pony tonneau and a roadster. The Pope Manufacturing Company is now well able to face the coming season with perfect confidence. The new models continue the general features of former Pope-Hartford designs; the changes are mostly external. The straight-line body has been adopted, and the hood and radiator slightly modified to correspond, though not so as to impair their distinctiveness. All three models will list at \$2,750.

The 30-horsepower motor retains its paired cylinders and overhead valves, but its external appearance has been considerably changed by moving the commutator, magneto and carburetor to the other side and rearranging the manifolds and water piping, with a considerable improvement in accessibility. The housing of the two-to-one gears is now cast integral with the crankcase, and a system of oil pockets and grooves has been provided to secure the lubrication of the gears from the splash in the crankcase. This, together with a new arrangement and a new method of cutting the gears, insures smooth and quiet running. The crankshaft has been increased in size, and its bearings have also been enlarged and are now of a special white brass, instead of phosphor bronze as before. The motor is mounted on a sub-frame so arranged as to permit the withdrawal of the camshaft and all gears without removing it.

A new design of carburetor has been adopted, containing all the valuable features of that formerly used, with important

is supported on the frame at three points. Drive to the rear axle is through a shaft with two universal joints; a torsion rod of new design, with buffer springs, is provided to relieve it of strains due to rough roads.

A rear axle of the floating type is used, with Timken roller bearings throughout. A screw adjustment on the bearings of the bevel pinion shaft makes it possible to take up all wear. The bevel pinion has 14 teeth and meshes with a 46-tooth gear. The two sets of brakes are arranged one on a drum just behind

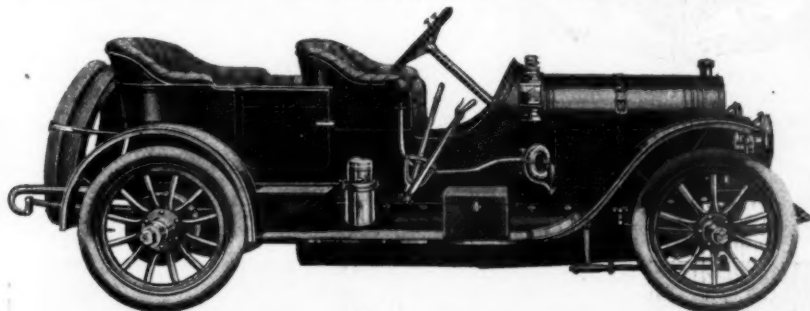


The Racy-looking Pope-Hartford Roadster for 1909.

the gear-set and the other on the rear hubs. The latter are of the internal toggle type, fully enclosed and adjustable for wear. The front axle is a solid I-beam forging. The distinctive Pope-Hartford frame, of wood armored with steel plates, has been retained, and an additional cross-member provided to support the front end of the torsion lever. The rear springs have been lengthened from 52 to 56 inches and are now swiveled on the rear axle to avoid all strains when putting on the brakes or starting under load. The wheelbase is 113 inches and the tires 34x4 both front and rear.

The body is much larger and roomier than last year's, and is of the latest straight-line design. The old hooded dash has been abolished and a straight one, of mahogany, substituted, in order to carry out the lines of the body. The sides of the hood are straight, instead of having a double curve, as formerly, and are hinged in three places; but the distinctive shape, which has for several years marked the Pope-Hartford, has not been perceptibly altered.

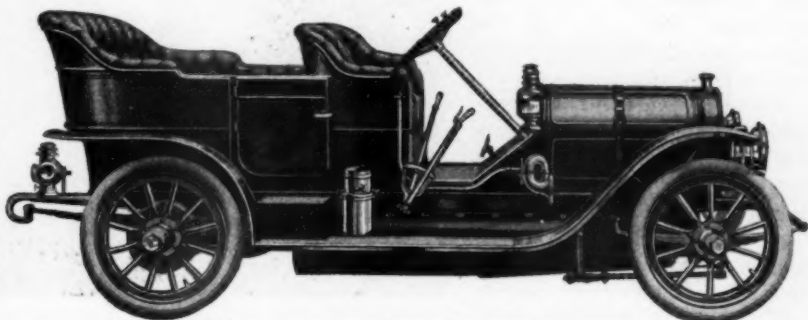
The chassis of the roadster and pony tonneau models will be the same as that of the touring car with the exception that the motor will be set further back on the frame, necessitating a slight rearrangement of other parts, and the steering column will be given a greater rake. A detachable seat for the chauffeur, on the running board, can be provided on the roadster. The body of the pony tonneau is very short, although affording ample leg-room for four people, and is correspondingly light. The rear seat is rather forward of the axle, which should make it very easy riding, and also leaves considerable room for spare tires and baggage.



The Pony Tonneau, the Latest Wrinkle in Body Design.

changes which will insure easier starting and make flooding practically impossible. Ignition is by storage batteries and coils, but a double system with Eisemann magneto and Carpentier coil can be supplied at an extra charge. A mechanical oiler located under the hood, with a sight-glass on the dash, feeds oil to the cylinders; the main bearings are lubricated by splash from the crankcase, suitable pockets and grooves being provided for this purpose in the walls of the crank case.

The transmission system follows standard and conventional lines. The clutch, of the cone type, has been increased 1 1/4 inches in diameter over last year's design, and is covered with a material specially composed for this purpose. The clutch bearing has been considerably lengthened to insure accurate centering of the cone in the flywheel. Between the clutch and the gear-set is a squared sliding sleeve, which compensates for any inaccuracies in alignment, and is adjustable to allow for any possible wear. The change-gear gives three speeds forward, operating on the selective principle. All gears are of chrome-nickel steel and the engaging ends of the teeth are beveled by a new process to insure quick and easy meshing, without noise. All the gear-changing mechanism, with the exception of the hand lever, is enclosed in the gear-case, which



1909 Pope-Hartford with Full Tonneau Body.



IF evidences of the renewed wave of prosperity that is already generally felt by the automobile trade, and that bids fair to surpass anything ever known in the history of the industry where the selling during 1909 is concerned, were needed to bolster up the faith of the doubting ones, they could be found in the manufacturers' plans for the coming season. For instance, the Palmer & Singer Manufacturing Company is planning to turn out about 1,000 chassis for the 1909 season, and while this would not be sufficient to place any undue burden on their splendidly equipped plant, it is a more difficult task when it is considered that this number will consist of no less than five different and distinct models. This is the same quintette with which this firm opened the 1908 season, but of the five, two have proved so popular that the original quota of cars had to be multiplied by five in order to keep pace with the demand, and the sales department of the company was so occupied in handling these models that, to quote Sales Manager Botto, "the others were left to sell themselves."

These two were the Palmer-Singer "Six-sixty," a six-cylinder car of 60 horsepower, and the P. & S. "Skimabout," a special runabout type of car, with a 30-horsepower, four-cylinder motor, and as a result of the great amount of popularity they have been enjoying they are naturally the first of the new line to make their appearance for 1909. The orders for the new series of these two models are already said to exceed the number of cars of this type which were manufactured during the 1908 season. The present factory plans comprehend the construction of series of 250 cars of each of these models, and it is expected that 125 of each of the other three models will be turned out during the

course of the coming season, though, judging from the present demand for the two favorites, developments later in the season may make an increase in the figures, where they are concerned, a necessity.

As is evident from the accompanying photographs taken at the metropolitan plant of the company, these two models are already beginning to come through in numbers, the picture showing the "Six-sixty" chassis in the course of assembling. In view of the success with which this model met immediately upon being placed on the market, and the strength of the demand now in evi-

dence for it, there is apparently to be no let-up in the call for cars of the six-cylinder type during the coming season. They have had an opportunity to prove their merits in greater numbers than ever before during the past season, and the manner in which they have done so is quite evident from the demand for sixes for fall delivery.

The only noteworthy change in the "Skimabout" for 1909 is in the shape of the hood and the position of the radiator. Last year, it will be remembered, this speedy little car had a sloping hood somewhat resembling that of the Renault, while the radiator was under the footboards, just to the rear of the flywheel. While satisfactory, this arrangement was found to possess no particular advantage over the conventional one. So the 1909 "Skimabout," as shown in the photographs, has a neatly designed vertical tube radiator mounted in front of the engine, with a folding hood.



As Seen From the Front.



Assembly Room of the Palmer & Singer Mfg. Co.'s Factory.

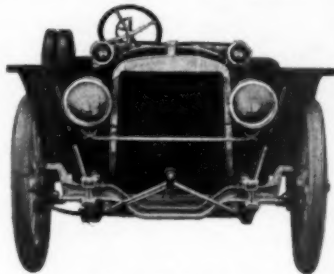
CONCERNING THE SEVEN 1909 AMERICANS

BUILDING seven models in touring car and roadster lines, all fitted with a 50-horsepower motor, but differing in body and other minor details, is the program of the American Motor Car Company, Indianapolis, Ind., for the approaching season. This program shows a unifying of effort, as compared with the present season, in which two styles of motor have been used, one with a 40-horsepower rating and the other with a 50. The characteristic American roadster with its underslung frame is continued with certain improvements which are looked upon to greatly increase its prestige, and the different models of touring cars bear striking resemblance to this year and carry their quota of refinements, as well as those advantages accruing from the use of high-grade steels.

It is in the roadster, however, that some of the important changes appear. Foremost in this category is the employment of 40-inch wheels, in place of the 36-inch size heretofore used. Adding 4 inches to the diameter of the wheels, in conjunction with raising the wheelbase from 112 to 122 inches, is looked upon vastly to increase the stability of this car, as well as augmenting its speed qualities, it having in tests shown 75 miles

per hour with full equipment and passengers. Using the 40-inch wheels has given it a clearance of 12 1/2 inches beneath the horizontal mud-apron, which extends from the radiator to the rear of the body. This car has been christened "the American traveler."

sign, difference in steering column inclination, different location of control levers and parts, and a pressure gasoline feed system from a tank under the dash is used in the tourist types. An interesting feature of the pressure feed in the roadster is that the gasoline from the 22-gallon tank carried on the rear of the chassis is forced by exhaust pressure to a 1-gallon tank located higher than the carburetor and in which tank is a regulating float, which controls the entrance of gasoline from the main tank. From this auxiliary tank the fuel feed is by gravity to the carburetor. The object of this extra tank is that the carburetor is relieved directly from feed by the exhaust pressure. It is claimed that, where exhaust pressure feeds the gasoline direct to the carburetor, when the first sinks, opening the needle valve, and allowing extra gasoline to enter the float chamber, this gasoline is in-

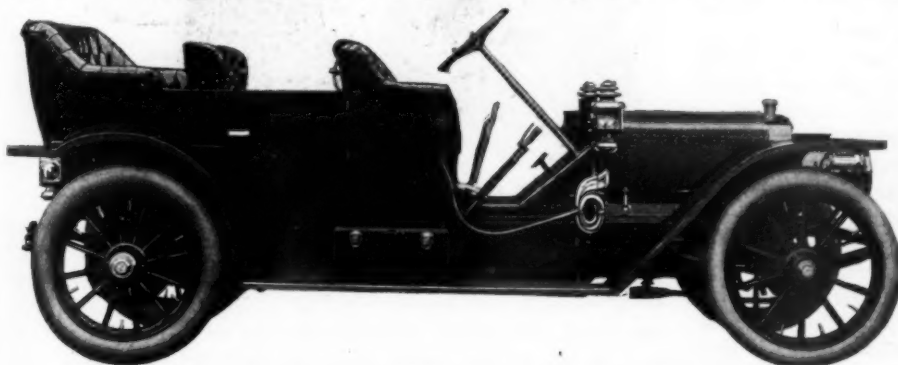


Front View 50-h.p. Roadster.

jected in a stream, which the weight of the float is incapable of immediately counteracting at the correct moment it should—with the result that the float chamber is fuller than it should be and there is danger of an overflow into the carburetor at the spring nozzle. With gravity feed from a small tank, the pressure on the carburetor is not so great, and consequently the danger of interfering with the nicety of float control is diminished.

The motor employed in all seven models is a conventional design employing four cylinders cast in pairs, each of the twin gray iron castings having an integral valve compartment on the right side in the bottom of which are contained, side by side, the nicked steel intake and exhaust valves. These cylinder castings are supported on a two-part crankcase, the upper part being the supporting member for the crankshaft as well as taking the support of the motor on the frame, thereby limiting the functions of the lower half to that of an oil reservoir. Care is

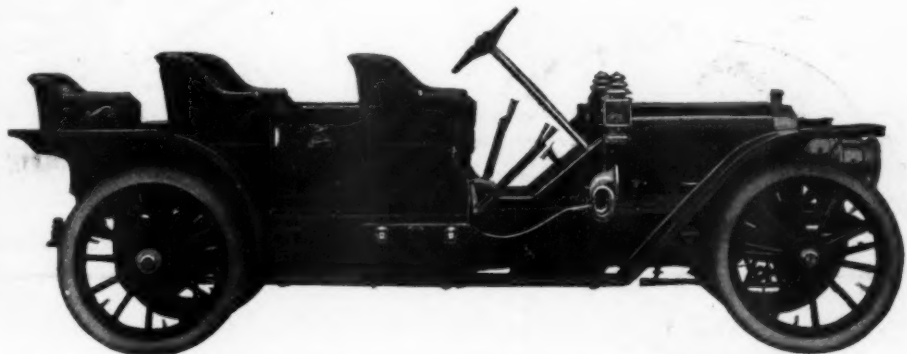
bestowed on the machining of the cylinders, each cylinder casting, after the first rough boring, being annealed to remove stresses which may exist in the casting, after which it is left to age before taking the final grinding. Each of the four pistons comes in for similar treatment, and, to retain the motor compression to the highest degree, a special grade of metal is employed for the piston rings, which is claimed not to lose its elasticity when subjected to heat. Considerable stress is placed upon the offsetting of the crankshaft. For the benefit of the amateur motorist a word of explanation may be used. In the



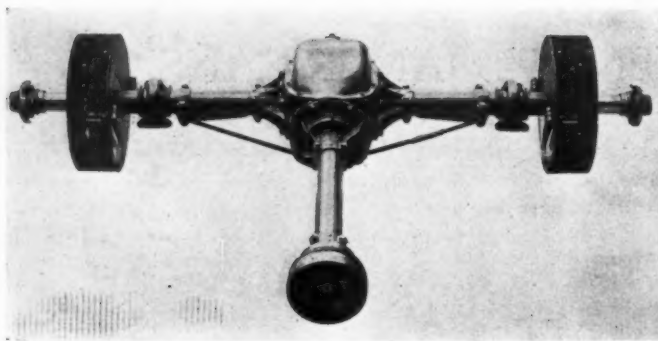
Fifty-horsepower Seven-passenger Touring Car—Mile-a-Minute Guarantee.

American tourist cars are built in five- and seven-passenger styles, the five-passenger type carrying a single rumble seat, which, in reality, brings it into the six-passenger class. The tourist cars carry quite a few different constructions when compared with the roadsters: the roadster employs a sub-frame, to which is attached the motor, transmission and steering gear; the tourist frame construction supports the motor and gearbox direct on the side member of the frame and has these members raised 2 1/2 inches in front of the rear axle to increase the range of the rear spring action. Semi-elliptic springs are employed regularly on the roadster type, whereas on the tourists semi-elliptics are used in front and a platform suspension in the rear. The roadster carries its mechanical lubricator on the dash; the tourist has a similar oiler carried beneath the front footboards. Added to these noticeable changes are differences in radiator de-

sign, difference in steering column inclination, different location of control levers and parts, and a pressure gasoline feed system from a tank under the dash is used in the tourist types. An interesting feature of the pressure feed in the roadster is that the gasoline from the 22-gallon tank carried on the rear of the chassis is forced by exhaust pressure to a 1-gallon tank located higher than the carburetor and in which tank is a regulating float, which controls the entrance of gasoline from the main tank. From this auxiliary tank the fuel feed is by gravity to the carburetor. The object of this extra tank is that the carburetor is relieved directly from feed by the exhaust pressure. It is claimed that, where exhaust pressure feeds the gasoline direct to the carburetor, when the first sinks, opening the needle valve, and allowing extra gasoline to enter the float chamber, this gasoline is in-



Fifty-horsepower Touring Car, with Five-passenger Body Equipment.



American Rear Axle—Two Sets of Expanding Brakes.

regular motor, the crankshaft is directly beneath the center of the cylinder board, but in the offset shaft it is placed nearer the right side, the reason of this being that on the explosion stroke the connecting rod has less angularity than if the crankshaft were located in the center. This diminishing of the connecting rod angularity reduces the pressure on the side of the cylinder during the explosion stroke, which should result in an increase in power, a diminution of the wear on the piston rings and a reduction of the vibration in the motor. With the offset crankshaft, while the angularity of the connecting rod on the explosion and suction strokes is lessened, it is true it is increased on the compression and exhaust strokes, in both of which, however, the work done is small in comparison with that of the explosion stroke. Connecting rods are special alloyed steel forgings, built in "H" sections, carrying hardened bronze bushings in their upper ends, where they attach to the wrist-pins, and have at the lower ends the usual marine construction with a cap secured by double-nutted bolts and split pins. Lastly, and most important of the moving parts of the motor, comes the forged crankshaft made from a solid billet of steel, after which it is heat-treated and machined to balance. Freedom from vibration is aimed at by finishing the bearings to accuracy with a grinding process. In attaching the different gears to the camshaft, as well as to the other motor shafts, the use of a flange on the shaft to which the gear bolts is resorted to.

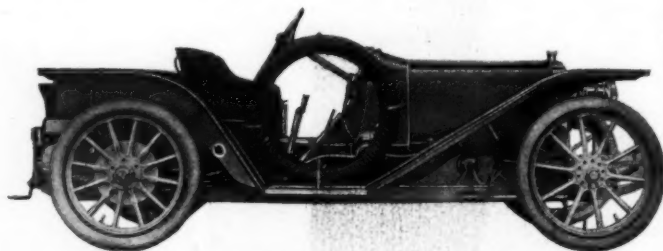
In manufacturing the cylinder castings, the large aluminum plate acting as a lid or cover to the water jacket in each twin casting is made use of, the claimed advantages of such construction being the certainty of removing all core sand in the foundry, as well as the increased facilities offered for cleaning.

Viewed exteriorly, the motor is a well-balanced unit, in spite of its design calling for the location of both sets of valves on the right side. Grouped on the right are the valves, the carbureter, the timer for one set of ignition and the intake and exhaust manifolds; on the other side, a casual inspection reveals the Bosch high-tension magneto and the centrifugal water pump, the pulley on the end of the pump and magneto shaft for driving the fan and, in the roadster motor, to these must be added the gravity feed gasoline tank

carried opposite the space between the cylinder castings. In order to avoid puncturing the half-time gear housing, the fan pulley on the pump shaft is located in the rear of this housing.

Intake and exhaust valves, made interchangeable, and operated from the same camshaft, have the push-rods and rollers hardened, and the push-rod guides are secured in the crankcase by a four-arm yoke with center bolt; one yoke securing the guides for the intake and exhaust valves for each cylinder. The upper ends of the valve push-rods are threaded to take an adjusting and lock-nut for valve timing. The intake manifold is a one-piece casting made with easy curves, and the exhaust manifold (a large-sized malleable iron casting) is of the horizontal one-piece type and is ribbed to increase strength. Locating the intake manifold below and closer to the cylinders than the exhaust manifold has the advantage of tending to prevent the condensation of the mixture en route from the carbureter to the cylinder.

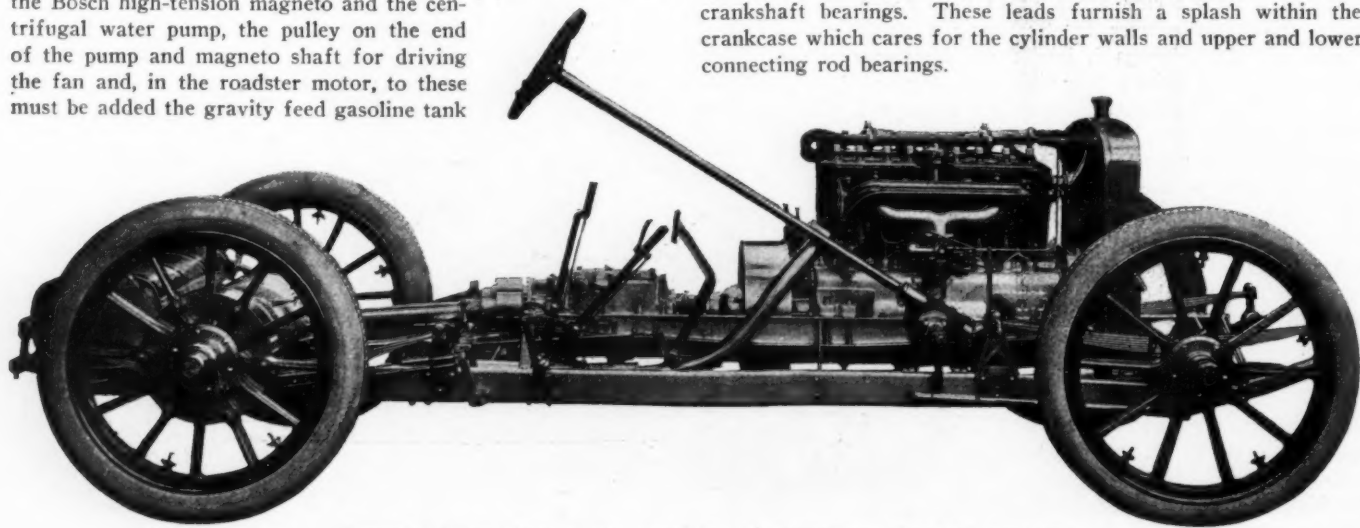
Ignition is by two independent sets, the main one a Bosch high-tension magneto which incorporates within itself the means for high-tensioning the current, the make-and-break parts and the distributing means. With a system of this nature, coils carried on the dash or beneath the car seats are done away with, and distributors or commutators on the engine are eliminated. Wiring is reduced to a minimum. The supplementary or reserve system is a storage cell, the low-tension current from which is high-tensioned through a roller type commutator carried



Solid and Compact American Roadster—50-h.p.

on the top of a stationary aluminum housing on the right side of the motor between the front and rear cylinder castings. The vertical shaft carrying the timer takes its drive from the camshaft through helical gears, and, in advancing or retarding the spark, the commutator part carrying the wires remains stationary, the advance or retard being accomplished by changing the relation between the gear on the camshaft and that on the timer shaft. The wiring is run through fiber tubing and the terminals on the spark plugs are so designed as to be removed from the engine, when it is in operation, without danger of a shock.

The lubrication of each model calls for a six-speed mechanical lubricator, four of the leads of which connect with the cylinder walls on the left side and the other two with the crankshaft bearings. These leads furnish a splash within the crankcase which cares for the cylinder walls and upper and lower connecting rod bearings.



Powerful Racy Lines of the American 50-horsepower Roadster for 1909.

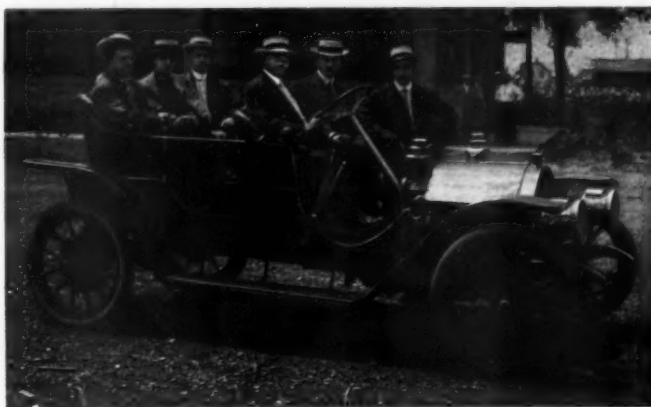
In the cooling system the centrifugal pump located centrally on the left has a double intake to increase its capacity, and in keeping with this is the employment of large diameter pipes. The circulation is from the pump to the jackets immediately beneath the exhaust valve, this being the hottest part of the engine. The exit is from the cylinder heads, the pipe therefrom branching in "T" form to the upper sides of the radiator. The radiators employed in both tourist and roadster types are of the vertical copper tube variety, with 5 1-2-gallon capacity in each. In both radiators the vertical copper tubes are narrow and the radiating quality is increased by the addition of a piece of sheet copper from which there are punched small corrugated fins, which corrugations attach to the tubes by immersion in a solder bath. With this construction all seams in the copper tubes are on the front and back surfaces, permitting of repairing a leak by the use of the soldering iron. In addition there is a 16-inch fan supported on an arm from the front cylinder and driven by a 1-inch flat belt.

First in the transmission system is the leather-faced cone clutch. The thrust is self-contained and is taken on a ball thrust-bearing. In the disengagement of the clutch, the strength of the spring is overcome by giving the clutch pedal leverage a nine-to-one leverage. Between this clutch and the selective gear is a universal coupling in which the square ends of the coupled shaft engage with square driving heads, which are made in halves and divided longitudinally, so that they may be uncoupled by removing the bolts which hold the halves together. This coupling allows of removing either the clutch or the transmission without interfering with the other.

The gear-set, a standard construction, gives four forward speeds, direct on the high, and has a reverse in which the gear revolves only when in use. Chrome nickel steel is employed in all gears, and the shafts are of special alloy steel and are carried on ball-bearings. The shaft which carries the sliding gears has four splines milled on it, a construction which eliminates keys and other parts not integral with the shaft.

Drive from the change-gear is through a propeller shaft with universal to a floating rear axle on the ends of which are claw clutches for engagement with the wheel hubs. A tubular torsion rod completely encases the propeller shaft, and at the front end of it is a universal joint support carried on the cross member of the frame, which acts as the support for the rear end of the gear case.

In a close scrutiny of the running gears employed on the roadster and tourist cars a standard construction based on conventional lines appear. The touring car frames are built up of two side members and three cross-pieces of alloy steel; the side channel members have a maximum depth of 5 inches, a 1 3/4-inch web, and 3-16-inch stock. The crankcase acts as a cross member at the front. The roadster frame, of the same stock, has the side members narrowed at the dash to increase the turning angle of the car, and, as already mentioned, employs a superframe. The springs employed on the touring car are 42 inches in front, and the three-part platform suspension of the rear has the side members 48 inches long and the transverse member 39. The side members are offset on the axle so as to make the front end equal in length to the rear end plus half the length of the cross frame, which is supposed to give the same spring action as from a semi-elliptic 67 1/2 inches long. Compression grease cups are provided at the head of each spring bolt.



Officers of the Chalmers-Detroit Motor Company.

E. R. Thomas is at the wheel, with Mr. Chalmers sitting beside him. H. E. Coffin, vice-president and designer, is standing up. In the back seat is J. J. Brady, second vice-president and factory manager, and next to him is F. O. Benzer, secretary; while next to him is Roy D. Chapin, treasurer and general manager.

A NEW RENAULT FOR AMERICAN ROADS.

In order to meet the demand for a car designed to meet the unusually strenuous conditions presented by American roads, Manager Paul Lecroix, of the Renault Frères selling branch, is now importing a new model especially designed for this purpose. The motor is a four-cylinder, 20-30 horsepower type, and is characterized by the usual features that have become familiar on the Renault motors during the last five or six years. But the chassis itself is lighter, shorter and narrower than the standard Renault chassis of the same kind designed for town use. The springs have been reinforced, the Renault liquid shock absorbers fitted, sturdier axles employed, and in every way the car has been fitted to travel over rough roads at a good speed.

The matter of clearance has come in for special attention, full 10 inches being allowed, the wheelbase being 120 inches. While the water-cooling system is of the same type as that which usually distinguishes the Renault, that is, with the copper tube radiator back of the motor and theremo-syphon circulation, the radiator itself, in this case, has been considerably enlarged, and the bonnet has been made much longer. The control levers are much shorter than in the regular type. As a runabout this car is capable of 60 miles an hour, and has been designed with a capacity for high speed on rough roads. The complete chassis tips the scales at 2,000 pounds, and when equipped with a runabout type of body lists at \$6,000.



New 20-30-h.p. Renault—Manager Paul Lacroix at Wheel, with Madam Lacroix Beside Him.



Vol. XIX

Thursday, September 3, 1908

No. 10

THE CLASS JOURNAL COMPANY

Thirty-ninth Street Building, 231-241 West 39th St.
New York City

H. M. SWETLAND, President

EDITORIAL DEPARTMENT

A. G. BATCHELDER, Managing Editor
R. F. KELSEY, Associate Editor C. B. HAYWARD, Engineering Editor
W. F. BRADLEY, Foreign Representative

BUSINESS DEPARTMENT

A. B. SWETLAND, Business Manager
LOUIS R. SMITH FRANK B. BARNETT
W. I. RALPH, 1035 Old South Building, Boston, Mass.
C. H. GURNETT, H. E. WESTERDALE 1200 Michigan Ave., Chicago, Ill.

Cable Address ----- Autoland, New York
Long Distance Telephone ----- 2046 Bryant, New York

SUBSCRIPTION RATES:

United States and Mexico ----- One Year, \$3.00
Other Countries in Postal Union, including Canada ----- One Year, 5.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft,
Post-Office or Express Money Order, or Register your letter.

FOREIGN SUBSCRIPTION AGENTS:

ENGLAND:—W. H. Smith & Sons, Ltd., 186 Strand, London, W. C., and all their
railroad bookstalls and agencies throughout Great Britain; also in Paris at
248 Rue de Rivoli.
FRANCE:—L. Baudry de Saunier, offices of "Omnia," 20 Rue Duret, Avenue de
la Grande Armee, Paris.
GERMANY:—A. Seydel Mohrenstrasse 9, Berlin.

Entered at New York, N. Y., as second-class matter.
The Automobile is a consolidation of The Automobile (monthly) and the Motor
Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903,
and the Automobile Magazine (monthly), July, 1907.

Copies printed in 1905	- - - - -	730,000
" " in 1906	- - - - -	791,000
" " in 1907	- - - - -	888,000

THE IMPORTANCE OF ROAD CONGRESSES.

No more significant indication of the awakening public interest in good roads could be cited than the various congresses of road-makers which are being held in all parts of the country. Last week the American Association of Park Superintendents met at Minneapolis; during the latter part of this month the New Jersey grange and automobile clubs will hold a joint convention at Atlantic City; and then, in October, will come the International Road Congress at Paris.

These congresses mean that road building and maintenance must now be undertaken scientifically. Hitherto, in most parts of the United States we have been working our roads under about the same system as was in use in France at the time of the French Revolution. Every petty road official was left entirely to his own judgment as to how the work should be done. One preferred narrow roads, another wide roads; one said roads should be flat, another said they should be crowned; but nearly all agreed that the best repair materials were brickbats, sod and brush. Some States had laws requiring all able-bodied men to work a certain number of days a year on the public roads, and others allowed property taxes to be worked out in the same way. Nobody ever expected a day's work from a man who was working out his tax, and the occasion was usually looked

upon as a huge joke. No system ever invented was more ingeniously planned to accomplish nothing.

Happily, most of this has been changed. All the more thickly settled States, at least, have passed some form of State aid legislation, and have responsible officials in charge. But it cannot be expected that the mere appropriation of so many thousand dollars will insure an adequate improvement in the roads, or that the creation of the office of "State road supervisor" or "commissioner" at so many dollars a year will instantly bring forth a man competent to fill the position. The building of roads—real roads, not strips of unoccupied land—is a science, and cannot be learned in a day.

Moreover, it is a science which is just now undergoing important changes. The increasing use of automobiles running at high speeds has introduced a problem which as yet remains unsolved. Just what damage, if any, a rapidly moving automobile does to a macadam road does not seem to have been definitely settled; but there can be no doubt that many of the present roads damage the automobiles, or, at least, seriously detract from the pleasure of riding in them. Of course, some calamity howlers will say this only proves that the speed of automobiles should be more rigorously restricted. But this country cannot afford to stand in the way of progress, even for the sake of preserving a much better and more expensive system of roads than we actually possess. Most road builders see the matter in the proper light, and admit that if our roads and our automobiles do not agree, it is the roads which must be changed.



VANDERBILT RACE AN INDUSTRY'S ASSET.

Whether one interested in racing, but not in the "racing war," accepts as logical the attitude of the A. A. A. in its refusal to adopt "international" conditions for the 1908 Vanderbilt Cup race close to New York City, and whether one comprehends how the A. C. A., or an energetic part of it, became convinced that it was justified in running at Savannah what is practically an event in this country for the European makers, that unbiased person would still wonder at the continuance of a situation which threatens a chaos in competition and a consequent loss of interest by the general public. Automobile racing of the high-speed sort is not destined for a long life. The A. C. A. may have the credit of shortening it considerably, and the price which it is paying will total not a few thousands of dollars. Of course, the racing element of the club will stubbornly oppose any compromise as long as it can have its bills O.K.'d and occupy the center of the stage. But the reckoning must come sooner or later.

Just now it does look as though the American makers would see how much it is to their advantage to come to the support of the classic Vanderbilt, and help themselves by helping it, and leave the foreigners to flock by themselves in the Southland with a minor edition of the French Grand Prix. The wisdom of the Knox Company, the Mora, Acme, and Chadwick should be an example for a deluge of American entries for what, as an "American event," will be of far greater import to the automobile-buying public than a race designated as "international." A Vanderbilt race failure will be a positive injury to the industry. It should not be made possible by any controversy of the moment.

KANSAS CITY CLUB LOYAL TO A. A. A.

President William H. Hotchkiss, of the American Automobile Association, Tuesday received the following telegram from the Kansas City Automobile Club, which is self-explanatory:

Cannot understand why rumor is so persistently circulated that the Automobile Club of Kansas City has withdrawn from the American Automobile Association. We wish to express to you most emphatically our allegiance to the American Automobile Association and to authorize you to deny any statement to the contrary.

(Signed) W. W. COWEN, President,
Automobile Club of Kansas City.

BUFFALO CLUB LEADS IN ACTIVE MEMBERS.

BUFFALO, Sept. 1.—The Automobile Club of Buffalo, of which Frank B. Hower is the president and D. H. Lewis is the secretary, now has 1,394 active members, which gives it the largest active membership of any club in the entire country. The Automobile Club of America only has 1,307 active members, though it has an associate list of 335.

President Hower anticipates that the Buffalo club will have 2,000 members before the end of the year. In view of the fact that the best results for automobiling generally are the prime consideration of the club, it believes that members and a moderate membership fee constitute the best means of securing that which is desired.

LOUIS KISSEL VICTIM OF ASSASSIN'S BULLET.

MILWAUKEE, WIS., Aug. 31.—Louis Kissel, president of the Kissel Motor Car Company, of Hartford, Wis., is dead, the result of an assassin's bullet. Mr. Kissel was shot in his office on August 20 by John Gerbier, a Polish employee, who had fancied grievances and gave Mr. Kissel no opportunity to hear them. Mr. Kissel lingered between life and death in the Milwaukee Hospital here until Friday, when life ebbed away. Septic peritonitis was the immediate cause of death. Mr. Kissel was born in Germany on August 14, 1838. He came to Washington county, Wis., at the age of 19. Thirty-five years ago, having gained a competency on his farm, he moved to Hartford, the county seat, and with his sons established the city's first important industry, the Hartford Plow Works. He founded the Hartford Lumber Company, the First National Bank of Hartford, the Northrup-Tentel Fur Company, the Hartford Electric Company, the L. Kissel & Sons Co., manufacturers of implements and vehicles, and lastly, the Kissel Motor Car Company, which has come to be the most important and largest industry in east central Wisconsin.

MITCHELLITES HAVE FAMILY REUNION.

RACINE, Wis., Aug. 31.—Concluding the most novel three-day conclave of agents that ever assembled at a motor factory in annual business-pleasure meeting on last Saturday evening, 125 men, who dispose of the Racine-made cars, left their homes, which are in 34 States and far-off Alaska, Porto Rico, and the City of Mexico, bound in honor to dispose of more than \$4,000,000 worth of 1909 Mitchell cars—the estimated output of the big works.

President William Mitchell Lewis, of the Mitchell Motor Car Company, Sales Manager James W. Gilson, Secretary G. V. Rogers, Designer John Bate, and James Cram, who acted as hosts for the annual "family gathering," provided a three-day melange for the men who sell cars and address the company officials familiarly as "Bill," "Jim," "Jack," etc., that began Thursday, August 27, with an inspection of the enlarged plant and soon changed to a series of luncheons and dinners at the Racine Golf Club, with a special performance at a local theater monopolized for the evening by the Mitchell company for its guests. Practically all of the allotments for the 1909 output were made in a short session in Mr. Gilson's office on the morning of the first day of the convention.

TIRE PRICES GENERALLY LOWER.

CHICAGO, Sept. 1.—As anticipated, to-day saw a general revision of list prices on motor car tires by the leading makers. Some of them have not as yet made their formal announcements, but those that haven't declare they will have their statements ready inside of a week. However, the Fisk, Diamond, and Goodrich came out with their announcements to-day, while the G & J, Goodyear, Firestone, and Morgan & Wright have their lists about ready to give out.

Without going into details, it is evident that there has been a general reduction all along the line, which will average up at about 15 per cent. The users of big tires will profit more by the reduction than any one else, in some cases the reduction on tires of 36-inch sizes amounting to 20 per cent.

The Fisk company held its session here in Chicago last week. Following this meeting, B. H. Pratt, of the company, had the following to say:

"This revision of prices means that the tire business is down to a hardpan basis. It means that the tire manufacturers will have to do twice as much business to make the same profit as they did in the year just ending. But we are not complaining, for the outlook justifies us in revising the lists. The new list means that the percentage between the tire companies and the dealers and makers will be cut down and that the users of tires will be the ones to profit most. It also means that the price-cutters will be frozen out and that the trade will be thrown into legitimate channels, that is, the dealers and garage people will get the business. The reductions range from 14 to 20 per cent., as, for instance, in the bolted tires made by us there is a 20 per cent. reduction in the 36 by 5-inch size."

"The G & J prices are not ready to announce yet," declared F. S. Cropley, of that concern's Chicago branch. "We are going to have a new list, though, and as is the case with the others, it will average about 15 per cent. reduction. The consumer is going to be the one to profit most by the changes, and the dealers' profit is going to be cut about 10 per cent. by all the rubber concerns."

REDUCTION IN TIRE PRICES ANNOUNCED.

AKRON, O., Aug. 29.—The Diamond Rubber Company announces a reduction in the price of their tires averaging 15 per cent., to go into effect September 1. Perhaps the most notable feature of the change is the placing of the quick detachable type of tires on the same price basis as the regular clinchers for one-piece rims. This is especially important for the reason that the quick-acting rims are being used more and more every year. However, the prices for 1909 are materially lower for every type of tire and for tubes as well as casings.

"The standardization of tires has made rapid progress," said Theo. Weigle, of the Diamond company, recently, "and in time to come will go still further. Quality and price will, of course, both be factors in the public's selection. We are able to join with the automobile manufacturers in the reduction of price by reason of our increased output and improved manufacturing methods. And in more ways than simply lower prices will the automobile owner get more for his money. The improvements we have made considerably increase the mileage tires will give and reduce tire repair bills at the same time. We plan to keep our plant in operation to its fullest capacity right through the fall and winter, and our output of 1909 goods, dating from this time, will be about 100 per cent. larger than last year."

BRUSH CLIMBS TO TOP OF PIKE'S PEAK

DETROIT, Aug. 31.—Trinkle, the driver of the Brush efficiency car No. 3, wires from the summit of Pike's Peak: "Brush climbs all way on its own power."

"Brush No. 3" is one of the five Brush runabouts which were recently dispatched from this city to various parts of the country on demonstrations of their efficiency.

LIVE DOINGS OF THE AUTOMOBILE CLUBS

JERSEY CLUB DETECTS FRAUDULENT TRAP.

NEWARK, N. J., Aug. 31.—Following a number of complaints about the method of operation of Justice Housell's police trap at Highland Park, just outside of New Brunswick, the Board of Directors of the New Jersey Automobile and Motor Club instructed J. H. Wood, a member of the Legal Committee, to inspect it and obtain evidence to be brought before the State Motor Commissioner. Mr. Wood located the trap and watched its operation for some time. The timing was done by two boys, over an alleged quarter-mile stretch. The signaler at the beginning of the course stood over a hundred feet inside of the mark and signaled most cars when they came opposite him. When a car was going slowly he did not signal until it had gone two hundred feet past him, thus depriving the car of about one-fifth of the course. If the car covered this distance in less than 35 seconds the stop-watch man signaled to the constable, a quarter of a mile further down the road, who in turn arrested the driver. Justice Housell at first said he had had the course surveyed, but could not produce a surveyor's certificate. Later he admitted that he had used a tape measure. The constable and the two boys received fifty cents apiece for each arrest. The matter is now in the hands of the club's attorney. As a bald attempt at fraudulent extortion New Jersey automobilists consider this, the latest effort to hold up law-abiding drivers, to be about the limit. It is hoped the matter will be pushed to the limit and the offending "justice" severely punished.

NEW YORK CLUB NOW PLANS SCENIC TOUR.

NEW YORK, Sept. 2.—The "Ideal Tour" of New England, promoted in the early Summer by the Automobile Club of America, proved so picturesque and pleasurable to the coterie of participants that the club plans an Autumn run. The route selected by its bureau of tours is deemed rich enough in scenery to justify naming the proposed junket-a-motor "the scenic tour." It will be an eleven-day run, starting on September 28 and ending on October 8. The itinerary mapped out follows:

Sept. 28—New York to Mt. Pocono, Pa., via Del. Water Gap.....	100
Sept. 29—Mt. Pocono to Binghamton, via Wilkes-Barre.....	91
Sept. 30—Binghamton to Watkins.....	72
Oct. 1—Remain at Watkins.....	0
Oct. 2—Watkins to Richfield Springs.....	124
Oct. 3—Richfield Springs to Lake George.....	105½
Oct. 4—Lake George to Bluff Point (Plattsburg).....	105
Oct. 5—Remain at Hotel Champlain.....	0
Oct. 6—Bluff Point to Manchester, Vt., via Burlington.....	108
Oct. 7—Manchester, Vt., to Waterbury, Conn.....	138
Oct. 8—Waterbury, Conn., to New York.....	92
Total.....	935½

The route chosen crosses the Pocono and Catskill mountains, the foothills of the Adirondacks, enters the Lake George and Lake Champlain region and carries the caravan finally across the Green Mountains, whence the finish in New York will be reached by way of Waterbury, Conn. The route will be marked by green arrows with numbers referring the tourists to route cards.

MARYLAND CLUB TO AID GRAND JURY.

BALTIMORE, Md., Aug. 29.—The Grand Jury of this city has joined forces with the Automobile Club of Maryland in efforts to abolish accidents and reckless driving of automobiles. The jury has adopted resolutions favoring a scheme to compel drivers, whether owners or chauffeurs, to pass examinations and secure licenses showing that they are capable of operating automobiles in an efficient manner. The Automobile Club at its next meeting will take action upholding the resolutions of the Grand Jury. The club already has a bill nearly ready which requires drivers to pass an examination before an efficient jury before being allowed to drive a machine through the city streets and suburban highways.

MINNEAPOLIS CLUB IS A MODEL ONE.

MINNEAPOLIS, MINN., Aug. 31.—The Minneapolis Automobile Club recently opened its new country clubhouse with an informal reception to bondholders. The house has been open for about three weeks, and has been the center of automobile interest in the Twin Cities. The plans which have been carried out by the Minneapolis club have been more pretentious than at first expected, and universal satisfaction is expressed at the results attained by the officials in charge of the work.

The new clubhouse is located on a magnificent bluff in the Minnesota River valley, 16 miles from Minneapolis, by direct road. It is in the center of a stretch of country which includes many of the most popular drives about the Twin Cities, and can be reached by way of Minnetonka, or from St. Paul, in 50 or 60-mile drives, or direct from Minneapolis in a 16-mile drive. The house has been arranged to provide ample social attractions. Provisions have been made for house parties; a kitchen equipped in the most modern manner, and with facilities for caring for 200 guests has been built; and a café service equal to any found in the cities has been inaugurated.

The social end of the Minneapolis Club is subordinated, however, to the interests which induced its organization and have conspired to its growth. Directors of the club emphasize the



New Country Club House of the Minneapolis Automobile Club.

fact that the erection of the new \$20,000 clubhouse, and the maintenance of the town and country houses, is solely for the purpose of reaching all interests of the automobilist, and adding to the strength and activity of the club. The Minneapolis club has now a membership of 700, and this number is confidently expected to reach the 1,000 mark this winter. With this united strength, the club will greatly extend the scope of its work, in protecting the rights of the automobilists from unjust legislation; in pushing good roads work along scientific lines; and in compiling touring information, and providing signposts and guide boards for the traveled roads of the State.

The clubhouse just completed was erected by the issue of \$15,000 worth of bonds. It has been constructed in the most modern manner of concrete throughout, and is a model country club building. The total length of the structure is 320 feet. In the center is the main section of the house, two stories high, and containing the main reception room, the tap room, furnished in Flemish oak, the offices, and on the second floor sleeping quarters and bathrooms. The whole structure is a model of modern comfort and simple elegance.

A porch 90 by 35 feet runs across the river front of the building. It is enclosed by wire netting, and is arranged during the summer as a dining room, and from this porch a view may be had up and down the river for almost 25 miles. The brass furnishings of the clubhouse, designed by George H. Daggett, chairman of the building committee, are all representative of parts of automobiles, and carry out the spirit of the club life.

The club has ten acres, running down to the Minnesota River, and is figuring on the acquisition of eight more acres.

The Minnesota River is a favorite stream for canoeists. Plans are now being made by the automobile club for the building of a harbor 60 feet square, at the foot of the club's grounds, and the arrangement of storage place for 100 canoes, under the broad porch of the clubhouse.

Great credit is given to the directors of the club, and the building committee, for the hard work they have done. As chairman of the building committee, George H. Daggett gave personal attention to all the details of the work. R. R. Colburn, of the firm of Kees & Colburn, the clubhouse architects, and C. F. Haglin, the contractor, were both members of the building committee. The other members were Col. Frank M. Joyce, Harry E. Pence, and E. L. Brown.

BINGHAMTON AND SCRANTON GET ACQUAINTED.

BINGHAMTON, N. Y., Aug. 29.—The Board of Governors of the Binghamton Automobile Club, at a meeting held August 19, accepted in behalf of the club the invitation of the Scranton Automobile Club to participate in a meet which the latter club will hold on the Hartford Fair Grounds September 5. They expect to have a number of fancy races, a tug-of-war, with Binghamton on one side and Scranton on the other, a ball game, a tire-changing contest, an obstacle race and an egg race. In the egg race a basket is placed at the starting point and at distances of 100, 200 and 300 feet other baskets containing eggs are placed. The contestants, consisting of a lady and a gentleman in each car, start at the signal from the starting point, the lady being armed with a teaspoon, and at either the first or last basket, as they see fit, the lady dismounts, takes up an egg in the teaspoon and carries it to the starting point, where she deposits it in the basket without touching it with her hands. The one safely depositing an egg from each basket in the basket at the starting point wins the race.

The main object of the meet is for the automobilists of this section to become better acquainted, with the ultimate object of forwarding the good roads movement.

OCTOBER DATES FOR CLEVELAND CLUB.

CLEVELAND, Sept. 2.—The dates for the Cleveland Automobile Club's reliability contest will be October 7, 8, and 9, while the course will in all probability be a three days' triangular affair. Last year the cars ran in and out of the city each day, but this plan was found not to give any too much satisfaction.

A. C. A. ACQUIRES MORE REAL ESTATE.

NEW YORK, Sept. 1.—The Automobile Club of America has purchased three lots on West Fifty-fifth street in the rear of its present holding. The price paid was \$150,000. An addition to its present clubhouse will be built affording more garage room and an entrance on two streets.

ANOTHER CONNECTICUT BELIEVER IN SIGNS.

WILLIMANTIC, CONN., Sept. 1.—The recently formed Automobile Club of Willimantic has outlined a vigorous sign posting campaign and will expend surplus funds in this direction rather than otherwise.

MORE SPACE FOR INDEPENDENT SHOW.

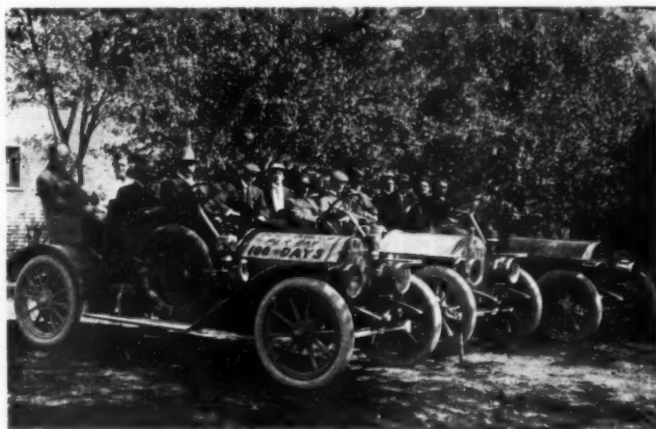
Applications for space and diagrams for the international show to be held at Grand Central Palace, New York, December 31 to January 7 next, have been mailed from the executive offices. Extra space has been secured by converting the big room heretofore used as a vitagraph theatre to exhibition purposes and by the removal of several partitions. The show committee is to meet to-day to pass upon the decoration scheme and pictorial posters.

HOMEcoming OF THE PREMIER CENTURION.

INDIANAPOLIS, IND., Sept. 1.—A great welcome home was given the Premier Century car last Friday when it reached within hailing distance of the Hoosier capital after a most successful trip through the East and over the route home via Baltimore, Hagerstown, Bedford Springs, Pittsburg, and Columbus, the Glidden Tour route of 1907. The welcome took place in the form of a chicken dinner at Greenfield, twenty-five miles east of Indianapolis, the company having as its guests about fifteen local and out-of-town autoists.

When Pilot Joseph Moore arrived at Greenfield his car had gone 10,625 miles, but to hear his engine, one would not have suspected that he had driven one-fifth that distance. Every cylinder was hitting to perfect time and the running could scarcely be heard. The condition of his engine was remarkable in the fact that not one part of its equipment has been replaced nor has it received more than ordinary care due an automobile. Moore stated positively that the only thing done to it was to fill it up with gasoline, water, and oil before starting each day.

What has proven to be one of the most interesting chapters in motordom was started on June 1. On that day the Premier Company started one of its stock cars on the run of 100 miles a day for 100 days in order to demonstrate the good qualities of



Premier Century Car in Foreground.

Joe Moore is driving. All cars in picture took part in Glidden tour. This party welcomed Moore on his return to Indianapolis.

the motor car of to-day. The car was run the required distance every day around Indianapolis for a while and was then driven to Chicago and return. After a few more trips around the Hoosier capital it was driven to Buffalo to take part in the Glidden Tour as a press car, and incidentally it covered far more than the 100 miles a day scheduled. It went through the tour in good shape, making every control on time. Following the finish of that event it was driven to Boston, New York, Washington, Philadelphia and several other Eastern cities. It was then headed towards home. The stunt of the century is officially scheduled to end September 8, but it has not been definitely decided as yet where the last day's run will be from. Announcement of this will be made later.

KOKOMO'S FIFTEENTH AUTO ANNIVERSARY.

INDIANAPOLIS, IND., Sept. 1.—A large number of automobile enthusiasts from this city will go to Kokomo tomorrow, where the fifteenth anniversary of the founding of the automobile industry in Kokomo will be celebrated.

Just fifteen years ago Elwood Haynes built his first gasoline automobile, now on exhibition in the Smithsonian Institute. Shortly afterwards the Haynes-Apperson Automobile Co. was organized, developing later into the Haynes Automobile Co. and Apperson Brothers.

A program appropriate of the occasion has been arranged and thousands of visitors are expected in the city.

News in General



Holsman Brigade Figured Prominently in Recent Hill Climb at Algonquin, Ill.

The Substitution Evil.—All automobile owners who take an active interest in the welfare of their cars realize the importance of using a proper grade of cylinder oil. Unfortunately some dealers make a practice of selling cheap and worthless oils under the names of reputable brands, and manufacturers of high-grade cylinder oil find it practically impossible to protect their interests and those of their customers against this substitution. The G. A. Haws Company, manufacturers of Panhard oil, quote a letter from T. T. Southwick: "Now I am a manufacturer and an active competitor, but I mean to be a decent one. It is an outrage on reputable manufacturers of high-grade oils and on the consumer who pays the price of a good oil for dealers to substitute an inferior oil, and yet I know, and you know, it is widely practiced, and that, too, by a class of dealers and garages that ought to be above such petty trickery. I know of large garages that sell from four to six brands of oil, and they buy only one, and pay less than 15 cents a gallon for it." These cheap oils are practically certain to cause heavy deposits of carbon in the cylinders, and the dealer who supplies them to an automobilist trying to buy a good oil not only defrauds his customer, but also risks ruining an expensive engine.

A Farmer Who Dissents.—In the opinion of a prominent Wapping farmer, the motor car is the greatest plague that exists on the country roads for the resident that suffer in consequence. He states: "The evils are numerous, fast running, the smell of gasoline, the immense clouds of dust, the destroying of roads, the fear of danger of meeting them, and the destruction of fowls." This individual is of the opinion that people can no longer enjoy their lawns and verandas in the good old Summer time. He is apparently something of a "timer," for he has discovered cars that actually went eighty miles an hour and asks if the next Legislature will stand for this sort of thing. He furthermore contends that the roads of to-day are a failure, bad for the horses' feet, etc. He winds up with a plea for the old roads, meaning, presumably, the soft country dirt variety, where one wallows in the mud after a heavy rain. His neighbors, however, drive cars and seem pretty well satisfied with things in general.

They're After Van.—The creditors of Van's Auto Tire Company, of 792 Seventh avenue, New York, which was incorporated on Feb. 25, 1908, with a capital of \$10,000, has filed a petition in bankruptcy. The creditors, who signed the petition, are Republic Rubber Company, \$236; the Hartford Rubber Works Company, \$652, and the Mutual Auto Accessories Company of America, \$268. They allege that the company is insolvent, removed and concealed its entire property except some rubber tools and machines of small value, purchased upon credit goods largely in excess of the amounts usually bought in the regular course of business, and immediately thereafter disposed of the goods, some at less than cost, and the remainder concealed in some place unknown to creditors, and the company kept the proceeds.

Offer for Pope-Waverly Plant.—Albert L. Pope, George A. Yule, and Egbert J. Tamlyn, receivers of the Pope Motor Car Company, have issued a statement to the creditors of the Pope Manufacturing Company which controls the former concern, setting forth an offer of \$200,000 for the Pope-Waverly plant made by Herbert H. Rice and Wilbur C. Johnson. The offer is cash, and a hearing will be given on the matter before the Court of Chancery at Newark, Sept. 8. Messrs. Rice and Johnson have deposited \$5,000 on account of their offer, the amount to be returned to them in the event of their not acquiring the plant. In the receivers' statement it is announced that the Rice-Johnson offer is the best ever received by them. The court hearing will, of course, decide whether or not the offer can be accepted. The Pope-Toledo hearing comes up on the same day.

Sleepers for Glidden Tour to Denver.—Since the proposal was made that the Glidden tour of 1909 be run from New York to Denver, there has been no little discussion of the practicability of the route from the standpoint of our night accommodations, particularly between Chicago and the Colorado metropolis. A moving camp pitched by professional tent men was the first suggestion. Col. Charles Clifton, of the George N. Pierce Company, is inclined toward the use of special trains. "The trains," says he, "would furnish food and lodging far better than would crowded hotels and at less cost. The tourists would have new,

comfortable quarters, and all luggage trouble would be saved by attaching baggage cars to the train."

Sales Records Broken.—All records for midsummer sales of Rambler cars were broken during the month of August, according to Thomas B. Jeffery & Company's announcement. During last month their sales were three times as large as during August, 1907, in spite of the fact that 1907 was the greatest year in the history of the Rambler business. This is regarded as an indication that the attitude of the automobile buying public is changing and that the automobile can maintain its popularity all the year round, appealing to buyers as well in the late summer and fall as in the early spring and summer.

Courses at Columbia University.—Columbia University will offer during the college year 1908-09 twenty evening courses specially adapted to the needs of technical and professional workers. These include courses in applied mechanics, applied physics, electricity and mathematics. The work begins October 26 and continues for twenty-five weeks. A full description of the courses is contained in the "Announcement of Extension Teaching," which may be obtained on application to the director of extension teaching, Columbia University, New York City.

Bergdoll to Build Taxicabs.—The Bergdoll Motor Car Company, of Philadelphia, which recently inaugurated the first taxicab service in the Quaker City, will add to its rolling stock by building a dozen or more of the vehicles in its big shop on the third floor of the new garage at Broad and Wood streets. Mr. Bergdoll is authority for the statement that the service is already a winner. In the new cabs about to be built will be incorporated several improvements which the company's experience of the past Summer has suggested.

A New Color Combination.—The Winton body-building department has evolved a new color combination which promises to be as popular as the old Winton maroon, which first appeared in 1902. It is a deep, rich royal purple, with black moulding and striping, and carmine running gear. There is a constant demand for new color schemes, and many new ones are proposed each season, but very few possess sufficient merit to survive.

Now They Want More Power.—About a year and a half ago the Board of Contract and Supply purchased for the Hartford Fire Department a two-cylinder Knox combination chemical and hose wagon. It is now the intention of the Fire Commissioners to install a motor of increased power, and an appropriation to cover the change will be asked for. The car has done very good service since it was installed.

Gaeth Eastern Demonstration.—The Gaeth car is to be called to the attention of the Eastern part of the country this year in no unmistakable manner. F. L. Pierce, of this city, has just left for the East in one of the 1909 models of this car, and will demonstrate it in all of the prominent Eastern centers, assisting the various Gaeth agents.

Progressiveness in Louisville.—The authorities of Louisville, Ky., have purchased a 20-horsepower Cadillac runabout for the use of Fire Chief Fillmore Tyson and his aide. The machine is equipped with a siren driven from the flywheel, which is kept continuously in action from the time the chief leaves headquarters until he arrives at the fire.

Fort Pitt Motor Mfg. Co.—There has been no reorganization of the Fort Pitt Motor Mfg. Co., according to information received from New Kensington, Pa. It was stated in "The Automobile" last week that George Von Rottweiler was reorganizing the Fort Pitt Co., but the latest information supplied is to the effect that he is organizing a new concern, of which he will be the head.

Another Auto Line.—A wide-awake Collinsville, Conn., man has started an auto bus line to connect with the Unionville trolley. The Collinsville trade practically all comes to Hartford, but hitherto there has been no trolley connection nearer than Unionville. This gap will now be covered by the automobile. A Knox truck accommodating twenty passengers will be used.

Forging Plant Resumes.—The Springfield Drop Forging Company, whose plant has been operated for the past five years by the Page-Storms Company, is, by the expiration of the lease, again in possession of its plant, dies, machinery and fixtures, and will continue making the same line.

Aid for Zeppelin.—The Continental Caoutchouc and Gutta Percha Company of Hanover has subscribed £750 to the Zeppelin fund.

IN AND ABOUT THE AGENCIES.

Studebaker.—A new company has been formed to represent the Studebaker in Harrisburg, Pa. It will make its headquarters at the old garage of the Capital City Auto Company on Market street, and in addition to its agency business, will carry a full line of supplies and accessories. A first-class repair shop is connected with the garage.

Stoddard-Dayton.—Andrew S. Robinson, formerly connected with the Harry S. Hought Company, agents for the Thomas car in New York City, will on September 8 take up new duties as sales manager for the Hamilton Auto Company, Philadelphia agents of the Stoddard-Dayton.

B. L. Toplitz-H. H. Holmes.—The Allenhurst garage of New York has discontinued the Midland agency. Its managers, Messrs. Toplitz and Holmes, are in the West arranging for another agency, said to be of a well known and established line of cars.

"Autogas" Tanks.—The New York branch of the Avery Portable Lighting Company, Milwaukee, Wis., makers of the "Autogas" acetylene tanks, will remove Sept. 1 to 243-5 West Fifty-seventh street, in the New Thoroughfare Building.

Schacht.—The Audubon Garage and Machine Works, 415 West One Hundred and Fiftieth street, New York City, has taken the New York agency for the Schacht high-wheel runabout, made by the Schacht Manufacturing Company, Cincinnati, O.

Reo.—Otto Owen, brother of R. M. Owen, and B. C. Buxton have organized the Reo Automobile Company and will look after the Chicago interests of that car. Their salesrooms will be at 1218 Michigan avenue.

Schacht Auto Runabout.—The Philadelphia agency for the Schacht runabout has been secured by D. Applegate & Co. and quarters have been fitted up at 326 North Broad street.

Empire Tires.—The Empire Automobile Tire Company, Trenton, N. J., announces that it has arranged for a Cleveland agency with E. T. Horsey, 1268 Euclid avenue.

Lozier.—The General Motor Car Company, Philadelphia agents for the Lozier, has moved into new quarters at 227-229 North Broad street.

PERSONAL TRADE MENTION.

Charles F. Greuter, for some time connected with the Matheson Motor Car Company as designer, is said to be seeking capital with the idea of forming a new company to build automobiles. The concern will start with a capital of \$200,000, and much of the material to be used in building the cars is said to be already in sight. The factory will probably be located in Wilkes-Barre, as several sites in that town are said to be under consideration.

George H. Smith.—Prior to his leaving town to take up his new duties as Northern New Jersey representative of the Winton, George H. Smith, former manager of the White branch house in Philadelphia, was tendered a farewell dinner by "The Shock Absorbers," an organization composed of automobile news writers and advertising solicitors connected with the Quaker City dailies.

Harry T. Clinton has resigned his charge of the publicity and advertising department of the Association of Licensed Automobile Manufacturers. The resignation took effect Sept. 1. Mr. Clinton has accepted the position of secretary to the contest committee of the Automobile Club of America. This, of course, necessitated his resignation as a member of the A. A. A. racing board.

F. J. Fisher will assume Sept. 1 the offices of secretary and treasurer of the Fisher Body Company of Detroit, Mich., and will also have charge of the general management. Mr. Fisher was formerly with the C. R. Wilson Body Company, also of Detroit.

H. M. Coale, for the past four years connected in various capacities with the Auto-Car Company, of Ardmore, Pa., has been appointed manager of the recently re-established branch house of the company at 249 North Broad street, Philadelphia.

A. G. Southworth has taken the New York agency of the Buick, and will handle it from 1733-35 Broadway, where formerly he represented the Pope Manufacturing Company.

S. A. Miles, general manager of the N. A. A. M., has returned to New York City after his usual Summer vacation at Christmas Cove, Me. He will visit Chicago in the near future on Chicago show matters.

William A. Rutz, formerly New England traveling representative of the Continental Caoutchouc Company, has joined the New Departure Company of Bristol and will cover the western territory.

Alfred Reeves, general manager of the A. M. C. M. A., returned to New York this week from a fortnight's rest on the Maine coast, much improved in health.

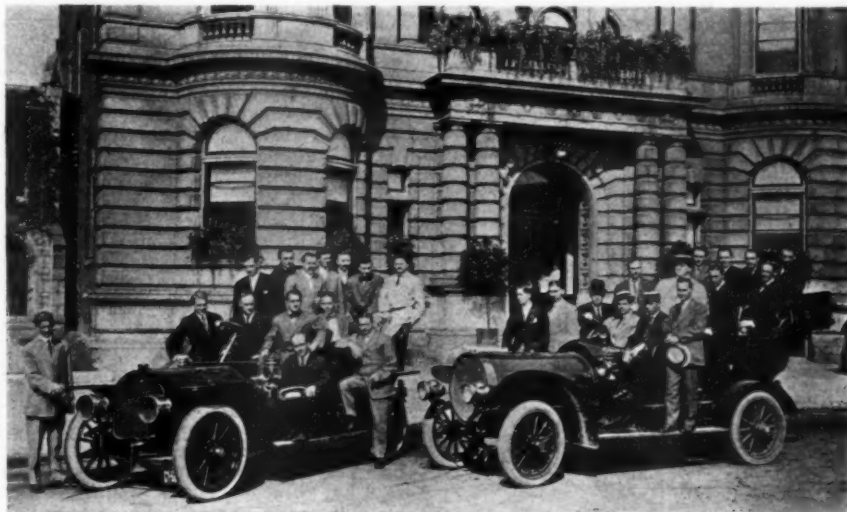
G & J TIRE MEN MEET.

INDIANAPOLIS, IND., Sept. 1.—The G & J Tire Company had a most successful conference of its army of representatives, all parts of the country being represented, as the concern has eighteen branches and distributing agents.

During the three days beginning August 26 there were meetings and entertainments of various kinds. President B. C. Dowse made the address of welcome, and announced that the great demand for G & J tires had compelled an increase of capacity, and the company had purchased a large amount of factory equipment which would be installed in the near future.

Matters of interest taken up and discussed included the 1909 prices and the new lines which will be added. These will be confined to motorcycle and bicycle tires. The G & J factory has been in operation twenty-four hours a day all this season, with its full capacity of workmen.

Among those who spoke during the various sessions were: E. S. Benson, secretary and treasurer; G. G. Hamilton, sales manager; H. H. Holloway, office manager; H. W. Waite, factory superintendent, and George W. Stephens, advertising manager.



Those Who Attended the G & J Conference.

First row (sitting) from left to right: W. B. Harding, purchasing agent; G. H. Hamilton, sales manager; H. A. Githens, general factory representative; B. D. Dowse, president; E. S. Benson, secretary and treasurer; H. W. Waite, factory superintendent; H. H. Holloway, office manager. Second row (standing): H. B. Dwell, order clerk; C. H. Mead, Portland, Ore.; W. C. Dowse, Chicago, Ill.; F. A. Drake, Philadelphia, Pa.; F. Burdick, Philadelphia, Pa.; F. S. Cropley, Chicago, Ill.; T. V. Graves, Chicago, Ill.; D. B. Price, Boston, Mass.; Saul Levy, Buffalo, N. Y.; D. E. Foote, Cleveland, Ohio; G. W. Stevens, advertising manager; W. K. Philip, New York, N. Y.; C. L. Elyea, Atlanta, Ga.; C. E. Starratt, San Francisco, Cal.; E. H. Sprague, Omaha, Neb. Third row (standing): C. S. Munson, Detroit, Mich.; G. M. West, Los Angeles, Cal.; H. G. Plant, Minneapolis, Minn.; H. H. Hubbard, Indianapolis, Ind.

INFORMATION FOR AUTO USERS

New Herz Magneto.—In the design of the Herz high-tension magneto, the manufacturers, Herz & Company, 203 Lafayette street, New York City, have worked very closely to a theoretical ideal, with the view of obtaining the

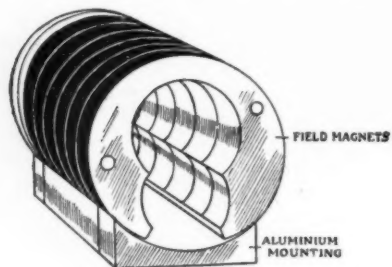


Fig. 1.

highest possible electrical efficiency. There is a marked saving in weight, the whole machine being reduced to a minimum in size, and it is claimed there is a remarkable sparking power at the slowest speed of rotation. A glance at the diagram of the complete machine (Fig. 5) shows that the construction does not follow conventional practice. The well-known "horseshoe" or U-shaped field magnets are absent, and a cylindrical, smooth, all-enclosed field system is seen

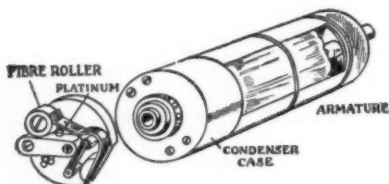


Fig. 3.

Fig. 2.

instead. The magnet system is in reality composed of several flat steel rings clamped together, their surfaces being ground with extreme accuracy. The next striking feature is that the usual independent pole pieces are entirely dispensed with. In the Herz magneto, the "one-piece" ideal is obtained quite simply, the armature space being bored out of the rings.

The magnet system of the Herz is shown in Fig. 1. The armature, which

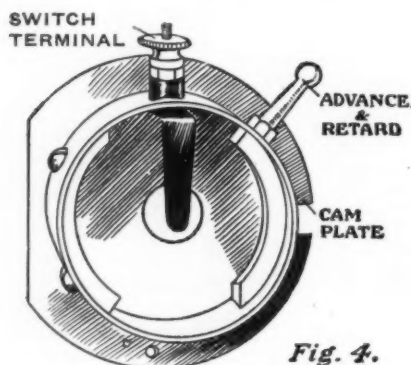


Fig. 4.

is of conventional design, is shown in Fig. 2. The bearings are of the ball type, and the ball cage is detachable from the outer ball race. The contact make and break device, shown in Fig. 3, is arranged as a complete detachable unit, fitted to the armature shaft by means of a small key way and feather. The contact device consists of three

parts: (1) a curved spring having a platinum contact at one end; (2) a small steel piece or block set slantwise, carrying an adjustable platinum contact; (3) a small hard fiber roller, loosely centered on a pin. The contact maker turns round bodily with the armature, and in rotating the fiber roller strikes against two steel projections held in a case shown in Fig. 4, and thus the break occurs at the point of maximum induction twice per revolution, and the sparking current is induced in the secondary winding.

The high-tension end of the armature has mounted upon it a deeply recessed V insulating collar with a metallic sector within it at the right-hand end of

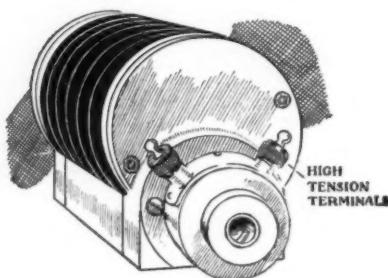


Fig. 5.

armature, which is not visible in the sketch, and upon this sector presses small carbon brushes for drawing off the high-tension current. The machine illustrated in Fig. 5 is a two-cylinder pattern, and in the four-cylinder pattern a high-tension distributor is combined. The casing of the machine is aluminum, forming a dust-tight, smooth and well-finished covering. The single-cylinder magneto weighs four and one-fourth pounds, and the four-cylinder machine weighs seven pounds. Every part is made on the interchangeable system at the Herz European factory, and kept in stock by Herz & Company at their New York headquarters.

New Mufflers and Timers.—The Garage Equipment Company, 285 East Water street, Milwaukee, Wis., is just placing two new specialties on the market, the "Anti-Explo" muffler and the De' Paul timer. The distinguishing feature of the former from which it derives its name, is an automatic anti-explosion valve or special cut-out, consisting of a specially designed valve, which relieves the pressure before it reaches the muffler. It is constructed in the best manner throughout, the heads being of malleable iron, while the four tubes are of heavy sheet steel securely fastened at the seams. These tubes are perforated at opposite ends by numerous holes, thus allowing the gas to expand from one tube to the other very rapidly and causing no sound as it escapes from the muffler. It is made in sizes ranging from 6 by 16 inches up to 8 by 30 inches, either plain or with special cut-out valve and exhaust nozzle. The De' Paul timer is made of the best quality bronze, with special high-speed steel rotating spindle. It also has a specially designed, tempered steel roller contact, set by micrometer adjustment, so as to deliver an equal spark to all cylinders at any speed of the motor, thus preventing missed explosions and increasing the efficiency of the motor, besides saving the platinum points of the vibrators on the coils. It is made in sizes to fit all motors and from

one to six cylinders. The company also makes special types of timers for the small Ford and Buick cars.

A New Speedometer.—The Peerless Specialty Company, of New York, has recently been incorporated by a number of men well known in the automobile trade, and among other articles they will manufacture the Peerless speedometer. This instrument has a mileage and maximum hand, and a season and trip odometer, and its distinguishing feature is the steadiness of the indicator. Realizing the need of a repair department for speedometers, the company will maintain a shop equipped for this work, and will repair and return any speedometer within twenty-four hours.

Simplicity Rectifier.—As the illustration shows, this is an extremely simple and compact piece of apparatus that may be placed anywhere. It is intended to rectify an alternating current in order that ignition accumulators may be charged from it, and is the product of the Auto & Supply Manufacturing Company, 2366-2370 Woodhill Road, Cleveland, O. No time or special preparation is required to start it, as this is accomplished simply by throwing the switch, and an accidental failure of the current can do no harm to either the battery or the rectifier, as the battery cannot discharge through the latter, and it will immediately resume operations when the current is on again. There is nothing to burn out or go wrong and it will operate on any load within the limits for which it is intended, without any fuss or trouble, and without the attention of an electrician.



THE SIMPLICITY RECTIFIER.

The solution is contained in a steel jar enameled white, while the electrodes are suspended from a hard glazed porcelain top on which are mounted the switch and the lamps employed to vary the resistance. Type S P will operate on any voltage from 50 to 126 and on any cycle, taking current up to 5 amperes so that it is capable of charging three six-volt batteries at the same time. At a charging rate of three amperes, it will consume two kilowatts per ten hours. Its dimensions are 7 inches diameter by 15 inches high. The only parts that need renewing are the chemical solution and the aluminum electrode. These give long service and may be replaced at nominal expense, so that their cost may be saved many times over by the saving effected through giving the accumulators a regular charge.